



**USAID**  
FROM THE AMERICAN PEOPLE



# IMPACT EVALUATION OF THE LAND ADMINISTRATION TO NURTURE DEVELOPMENT PROJECT IN AFAR, ETHIOPIA

Report on Baseline Findings

This publication was produced at the request of the United States Agency for International Development. It was prepared independently by The Cloudburst Group.

Photo Credit: Aidan Schneider—The Cloudburst Group

Written and prepared by Aleta Starosta, Kate Marple-Cantrell, Stephanie Fenner, Nicole Walter, Aidan Schneider, Ben Ewing, and Heather Huntington.

The authors would like to thank John McPeak, Peter Little, and Zemen Haddis for their review and guidance.

Prepared for the United States Agency for International Development, USAID Contract Number AID-OAA-TO-13-00019, Evaluation, Research and Communication (ERC) Task Order under Strengthening Tenure and Resource Rights (STARR) IQC No. AID-OAA-I-12-00030.

Implemented by:

The Cloudburst Group  
8400 Corporate Drive, Suite 550  
Landover, MD 20785-2238

# Impact Evaluation of the Land Administration to Nurture Development Project in Afar, Ethiopia

Report on Baseline Findings

MARCH 2017

## **DISCLAIMER**

The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

# CONTENTS

<b>CONTENTS .....</b>	<b>I</b>
<b>ACRONYMS .....</b>	<b>III</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>I</b>
<b>1.0 EVALUATION PURPOSE &amp; QUESTIONS .....</b>	<b>5</b>
EVALUATION PURPOSE .....	5
EVALUATION QUESTIONS.....	5
DATA SOURCES .....	7
PROJECT BACKGROUND.....	7
THE AFAR REGION.....	8
OVERVIEW OF LAND .....	10
<b>2.0 EVALUATION METHODS &amp; LIMITATIONS .....</b>	<b>13</b>
METHODS.....	13
SAMPLING METHODOLOGY.....	14
BASELINE DATA COLLECTION .....	17
CHALLENGES ENCOUNTERED .....	18
SAMPLE CHARACTERISTICS.....	21
<b>3.0 FINDINGS—GRAZING AREA CONDITION.....</b>	<b>28</b>
USE OF GRAZING AREAS IN THE WET SEASON.....	28
USE OF GRAZING AREAS IN THE DRY SEASON .....	30
MIGRATION .....	32
CHANGES IN CONDITIONS OF GRAZING LAND .....	35
<b>4.0 FINDINGS—TENURE SECURITY &amp; ACCESS .....</b>	<b>42</b>
TENURE SECURITY—GRAZING AREAS.....	42
RESTRICTIONS IN GRAZING AREA ACCESS.....	47
TENURE SECURITY—WATER POINTS.....	48
AGRICULTURE AND TENURE SECURITY .....	49
<b>5.0 FINDINGS—GOVERNANCE.....</b>	<b>51</b>
SATISFACTION WITH CUSTOMARY LEADERS .....	51
MEETINGS .....	54
RULES.....	55
RULE ENFORCEMENT .....	56
CONFLICT .....	58
INVESTORS.....	60
POSITIVE IMPACTS.....	62
NEGATIVE IMPACTS.....	63
<b>6.0 SUMMARY OF GENDER SPECIFIC FINDINGS .....</b>	<b>64</b>
GRAZING AREA ACCESS .....	64
WATER ACCESS.....	65
TENURE SECURITY .....	66
GOVERNANCE AND DECISION MAKING .....	67
HOUSEHOLD DECISION MAKING REGARDING EXPENDITURES.....	68
INHERITANCE .....	68

<b>7.0 BALANCE &amp; POWER .....</b>	<b>70</b>
METHODS FOR ASSESSING BALANCE.....	70
POWER ANALYSIS .....	81
<b>ANNEX I—LAND AFAR IE DESIGN REPORT .....</b>	<b>88</b>
<b>REFERENCES .....</b>	<b>89</b>

# ACRONYMS

BDS-CDR	BDS-Center for Development Research
CLGE	Community Landholding and Governance Entity
DD	Difference-in-Difference
ERC	Evaluation, Research, Communication
FGD	Focus Group Discussions
GoE	Government of Ethiopia
ICC	Intra-Class Correlation
IE	Impact Evaluation
IRB	Institutional Review Board
KII	Key Informant Interview
LAND	Land Administration to Nurture Development
MDES	Minimum Detectable Effect Size
NGO	Non-Government Organization
PA	Pastoralist Association
PPS	Probability Proportionate to Size
PRIME	Pastoralist Areas Resilience Improvement and Market Expansion
PSNP	Productive Safety Net Program
RCT	Randomized Control Trial
STARR	Strengthening Tenure and Resource Rights
SD	Standard Deviation
USAID	U.S. Agency for International Development



# EXECUTIVE SUMMARY

This Baseline Report analyzes baseline data from an impact evaluation (IE) of USAID/Ethiopia's Land Administration to Nurture Development Project (LAND, 2013–2018) in the Afar region of Ethiopia. The baseline survey analysis has two primary objectives: 1) to improve understanding of the project context in the evaluation area, especially variation across Chifra and Amibara *woredas*<sup>1</sup>; and 2) to provide an exploratory assessment of baseline differences across the IE comparison (intervention) groups that will be used to measure LAND's impacts.

LAND is designed to improve the security of land use rights to promote investment and development among land users and reduce inappropriate expropriations. Based on Ethiopian constitutional provisions, and a regional government commitment to recognize pastoralist land use rights, the LAND Project is undertaking a focused community land use rights formalization process.

The LAND Afar IE seeks to assess the outcomes and impacts of interventions that fall under Component 4 of the LAND project, including formal recognition of customary land use rights, improving communal land governance, as well as strengthening pastoral communities' capacity for land use planning and management and investment negotiations. The IE is designed as a quasi-experimental Difference-in-Difference (DD) study that compares two LAND treatment sites in Chifra and Amibara *woredas* to control areas. Treatment *gantas*<sup>2</sup> in Chifra are compared to control *gantas* in Telalak and Dewe *woredas*, and treatment *gantas* in Amibara are compared to control *gantas* in Gewane and Delucha *woredas*.

The overarching policy question that underlies this evaluation of LAND's Component 4 is:

**To what extent does empowering pastoral communities with stronger land use rights, improved land governance institutions, increased negotiation capacity, and better land use planning result in increased community investment and equitable economic growth?**

This IE will test a number of research hypotheses that follow from the evaluation objectives and project theory guiding LAND. The evaluation has the scope to rigorously assess the project's impact on indicators measured at the household level and the ganta level.

## **At the ganta level, specific hypotheses in this IE include:**

Communities receiving Component 4 of the LAND intervention (land use rights certification, boundary definition, registration and governance strengthening) will:

- H-1. Have lower community-wide incidence of conflicts;
- H-2. Perceive improved transparency, accountability, and representation of customary land governance institutions;
- H-3. Have improved land use planning capacity and sustainable land management of communal land;

---

<sup>1</sup> Regions of Ethiopia are divided into administrative *woredas*, or districts. There are 29 *woredas* in the Afar region, and nationally there are about 770 urban and rural *woredas* in Ethiopia.

<sup>2</sup> *Gantas* are communal settlements in the Afar region akin to villages in other locales. For more information, see "Organization of Communities in the Afar Region" in section 1.0;

- H-4. Have a reduced incidence of community land expropriation without adequate consultation and fair and timely compensation;
- H-5. Have improved rangeland and natural resource conditions;
- H-6. Have greater capacity to negotiate mutually beneficial contracts between communities and private sector investors;
- H-7. Perceive greater tenure security and protection of their community grazing land;
- H-8. Have a reduced incidence of unauthorized users encroaching on community land;
- H-9. Invest more in improving the condition of their land, water and livestock resources.

**At the household level, specific hypotheses in this IE include:**

Households in communities receiving the LAND Component 4 intervention will:

- *H-10.* Have improved livelihood and welfare outcomes.
- *H-11.* Invest more in improving the condition of their land, water, and livestock resources.
- *H-12.* Perceive improved transparency, accountability, and representativeness of legal and customary governance institutions.
- *H-13.* Perceive greater tenure security and protection of their household's land.
- *H-14.* Have lower community-wide incidence of conflicts.

This report presents a summary of several aspects of the baseline data collected from both planned treatment and control communities, including details on sample characteristics, grazing area access and conditions, grazing area tenure, gender differences, and ganta governance and conflict. The baseline data consist of six sources of primary community and household level data, including 2,987 head of household respondents, 1,507 wives, 263 ganta leaders, 150 focus group discussions (FGDs), 50 participatory mapping exercises, and 128 key informant interviews (KIIs) with various customary and government leaders. The data was collected across 266 communities in Chifra, Amibara, Gewane, Telalak, Dewe, and Delucha woredas from March–June of 2016.

The report also assesses the statistical power of the study to detect changes in important indicators, as well as the balance across treatment and control sites. Our assessment of likely indicator variables indicates that there is sufficient power to detect policy relevant impacts at the household level for most measures, and all of the likely indicator variables that were checked for sufficient power and those results are listed in Section 7 of this report. With regards to balance between treatment and control sites, we find that in Amibara and its controls, households are balanced across the majority of demographic, grazing area, governance, and tenure security indicators. In Chifra and its controls, households are also balanced across the majority of demographic, governance, and tenure security indicators, but not across grazing areas, where there are significant differences in household's assessment of grazing area conditions. These differences in perceived grazing area conditions will be taken into consideration during analysis.

Several key summary findings are described below. Most of the data collection occurred during extreme drought conditions in the Afar region due to El Niño weather patterns, and this had been ongoing for about 18 months at the time. Then, at the end of surveying, La Niña rains began, leading to severe floods in the study area. While periodic drought events are normal in the study region, these extreme weather events need to be taken into account during interpretation of findings since they may deviate from expected results for the area. In particular, local responses about herd movements and migration are likely to have been influenced by prolonged drought conditions, as opposed to a 'normal' non-drought



year. Reports about flood damage can similarly be expected to be excessive due to the timing of some surveys immediately following a flooding event.

## **GRAZING AREA CONDITIONS AND ACCESS**

The Afar region is subject to a bimodal seasonal weather pattern, with two wet seasons and two dry seasons each year. Over half of households in the sample utilize at least one grazing area outside of their resident ganta to graze their livestock during the wet season (53%, N=1587), and just over 40% of households migrate to a grazing area outside their ganta during the dry season (42%, N=1260)<sup>3</sup>. Chifra and Amibara woredas and their controls report generally similar usage of grazing areas, though there is variation in the prevalence of migration by woreda. In the wet season, most households whose herds do travel migrate their animals to a single area (83%, N=1294), and an additional 14% (N=221) migrate to two areas. However, it is rare for households to move to three or more places (4%, N=60).

Households overwhelmingly judge the condition of grazing areas as “bad” or “very bad” due to poor rains, bush encroachment, and increase in human and livestock population. Water point conditions are ranked similarly. Grazing areas in Amibara are particularly impacted by bush encroachment, and nearly three-quarters of respondents believe the spread of *Prosopis juliflora* (an invasive bush species that can be toxic if consumed by cattle and other livestock) is an important reason for poor conditions in their wet season grazing areas. To improve the conditions of their enclosed communal grazing areas, some of the ganta level surveys identified participation in land management activities, including removing invasive bush species (36%, N=62), fence repair (22%, N=37), water point maintenance (16%, N=27), and pasture seeding (12%, N=20). However, levels of participation by both household and wives in these activities are low according to surveys of these samples.

## **TENURE SECURITY**

In general, households, wives, and ganta leaders feel their land use rights are secure. Less than 10% of household heads or wives believe their wet or dry season grazing areas could be encroached upon by any actor, including customary leaders, investors, or members of outside clans. Respondents report similarly high levels of perceived security about their water points. The greatest perceived threat to tenure security comes from the national government, but the magnitude of the threat is still negligible. Restrictions to gantas’ access to wet and dry season grazing areas are incredibly rare, impacting just 3% of gantas, and are most likely to be imposed by customary leaders as opposed to government or investors. Cultivated agricultural activity is increasing in the study area, particularly in Amibara where nearly half of respondents cultivate or own irrigated or rain-fed farmland, but the increase in cultivation does not appear to come at the expense of households’ access to land or water. Only 5% (N=156) of households report any instances of grazing land being reallocated for farmland.

## **GOVERNANCE**

Overall, households and wives are satisfied with how customary leaders protect their grazing lands and water, and believe their leaders act fairly and inclusively. They hold similarly positive perceptions of the fairness of the land allocation process, and of the fairness of ganta rules. Nearly half of gantas have at least one rule about land management, and include regulations about cutting of trees, opening and closing of pastures, and access to water points. When rules exist, they are frequently monitored and

---

<sup>3</sup> These figures include households where all members migrate together and households where only a subset of members migrate with animals.

enforced, though less than a third of households believe that those who break the rules are punished. Conflicts are incredibly rare, impacting just 6% (N=193) of households. Finally, investors—largely cotton and sugar farming operations—have a growing presence in the study area, particularly in more settled Amibara. Though investors do not always engage with communities prior to beginning work in an area, two-thirds of respondents believe they have benefited from the presence of investors, including by receiving salaried jobs, opportunities for casual labor, and money transfers.

## **KEY GEOGRAPHIC DIFFERENCES**

The exploratory analysis reveals mostly similar responses between the Chifra and Amibara woredas and their respective controls on indicators about grazing area access and conditions, but there is some important dissonance between study areas regarding perceptions of tenure security, conflicts, and investor presence. Heads of households and wives in Chifra and its controls report lower levels of tenure security across a variety of indicators, particularly regarding the likelihood of national government giving away land to investors. Communities in Chifra and its controls are also more likely to experience disputes about the allocation of grazing land. In Amibara and its control sites, gantas are more likely to have their grazing land negatively impacted by the spread of invasive bush species, primarily *P. juliflora*. They are also more likely to report lacking access to a wet season grazing area than households in Chifra and its controls, in part because of bush encroachment. This initial data suggests that Amibara and its controls have a higher prevalence of investors, but fewer conflicts with those investors than Chifra and its control woredas. The program and policy implications of these findings are unclear, since the number of cases of investors in Chifra is so low it is difficult to draw firm conclusions. Interventions in the two areas should be tailored in such a way to account for the variation between these two regions.

## **GENDER**

Women are less likely than men to personally own livestock or to have their own access to grazing areas, but those who do migrate with men from their ganta can access grazing areas. Women are particularly affected by reduced availability of water, primarily caused by a lack of rain during the study period. The distance women travel to water points has increased, and the condition of these water points is consistently ranked ‘bad’ or ‘very bad’ in both wet and dry season grazing areas. Women’s roles in access and maintenance of water points on grazing lands are mixed, as at least one woman is included in more than two thirds of consultations that involve community members, but they perceive themselves to have the lowest relative decision making power of any actor in the community or clan. Still, roughly a quarter of wives report that women in their ganta participate in community decision making about water and land management, as well as decisions about grazing land allocation. Wives consistently report a greater perceived likelihood of encroachment by all actors of the wet and dry season grazing area lands used by their ganta than household survey respondents, though the percent of wives who believe the likelihood of encroachment by any particular actor remains low (<8%). A separate gender analysis is also presented in Section 6.

# I.0 EVALUATION PURPOSE & QUESTIONS

## EVALUATION PURPOSE

This report presents findings from the baseline data collected as part of an IE of USAID/Ethiopia's LAND (2013–2018) project activities in the Afar region of Ethiopia. The LAND Afar IE is being conducted by The Cloudburst Group through the Evaluation, Research, and Communication (ERC) Task Order under the USAID Strengthening Tenure and Resource Rights (STARR) IQC Contract. This evaluation will focus on land tenure security impacts in Ethiopia's Afar Region, in the Chifra and Amibara woredas, Administrative Zones 1 and 3 respectively<sup>4</sup>. These two woredas were identified by LAND, in consultation with the Afar regional government, for initial implementation of a pilot land use certification project for Afar pastoralists.

The USAID/Ethiopia LAND Project represents an innovative project to strengthen land tenure security among pastoralists through a pilot land use certification process. The LAND Project proposes a locally appropriate model to work with customary pastoral communities to increase land and resource tenure security, as well as with regional governments to develop policies and regulations that allow communal land use rights to be recognized and certified. Given the innovative model this project is testing, it is important to document the impact of the new formalization approach on pastoral communities and households, including the project's effect on livelihoods, resilience, tenure security, and conflict.

This IE proposes a framework for measuring the key development impacts of the LAND project in the Chifra and Amibara woredas. In particular, this evaluation seeks to assess the outcomes and impacts of interventions that fall under Component 4<sup>5</sup> of the LAND project, including formal recognition of customary land use rights, improving communal land governance, as well as strengthening pastoral communities' capacity for land use planning and management and investment negotiations.

## EVALUATION QUESTIONS

The LAND Afar IE is designed to measure the key development impacts of LAND Project activities in Afar that aim to strengthen communal land use rights in pastoral and agro-pastoral areas and to facilitate market linkages and economic growth, including the impacts on livelihoods, resilience, tenure security, and conflict.

---

<sup>4</sup> The USAID-funded Ethiopia LAND Project (2013–2018) is implemented by Tetra Tech in the Afar, Oromia and Somali Regional States. This IE is focused solely on LAND Project activities in Afar. Another IE of the LAND Project activities in Oromia is also being implemented separately. For more information, visit [www.usaidlandtenure.net/data](http://www.usaidlandtenure.net/data).

<sup>5</sup> Additional information about LAND project components can be found in the "Overview of LAND" and in Annex I—Land Afar IE Design Report.

This IE tests a number of research hypotheses that stem from the evaluation objectives and the LAND Project theory of change. Specifically, the evaluation will investigate the extent to which the package of interventions constituting Component 4 of USAID's LAND project generate the following outcomes and impacts:

1. Reduced incidence of community land expropriation without adequate consultation and fair and timely compensation;
2. Increased number of mutually beneficial contracts between communities and private sector investors;
3. Increased transparency, accountability, and representativeness of customary land governance institutions;
4. Improved land use planning and sustainable land management of communal lands;
5. Increased adoption of new or more sustainable economic (livelihood) strategies;
6. Increased or improved household/community assets, consumption, and/or investment;
7. Reduced incidence of unauthorized users encroaching on community land; and
8. Enhanced livelihood and welfare outcomes for minority or vulnerable groups, including women, the resource-constrained, agro-pastoralists, and youth within the targeted communities.

The overarching policy question that underlies this evaluation is:

**To what extent does empowering pastoral communities with stronger land use rights, improved land governance institutions, increased negotiation capacity, and better land use planning result in increased community investment and equitable economic growth?**

These evaluation objectives form the basis for a series of testable development hypotheses and indicators intended to measure the impact of LAND and to rigorously assess the project's impact on indicators measured at the household level and the ganta level.

**At the ganta level, specific hypotheses tested by this IE include:**

Communities receiving Component 4, LAND intervention (land use rights certification, boundary definition, registration and governance strengthening) will:

- *H-1.* have lower community-wide incidence of conflicts;
- *H-2.* perceive improved transparency, accountability, and representativeness of customary land governance institutions;
- *H-3.* have improved land use planning capacity and sustainable land management of communal land;
- *H-4.* have a reduced incidence of community land expropriation without adequate consultation and fair and timely compensation;
- *H-5.* have improved rangeland and natural resource conditions;
- *H-6.* have greater capacity to negotiate mutually beneficial contracts between communities and private sector investors;
- *H-7.* perceive greater tenure security and protection of their community grazing land;
- *H-8.* have a reduced incidence of unauthorized users encroaching on community land;
- *H-9.* invest more in improving the condition of their land, water and livestock resources.

**At the household level, specific hypotheses tested by this IE include:**

Households in communities receiving the LAND Component 4 intervention will:

- *H-10.* have improved livelihood and welfare outcomes.
- *H-11.* invest more in improving the condition of their land, water, and livestock resources.

- *H-12*. perceive improved transparency, accountability, and representativeness of legal and customary governance institutions.
- *H-13*. perceive greater tenure security and protection of their household's land.
- *H-14*. have lower community-wide incidence of conflicts.

## DATA SOURCES

To test these hypotheses, the evaluation will use six primary sources of community- and household-level data to collect information on customary land governance, tenure security, rangeland conditions, land-use conflict, livelihood outcomes, etc.:

1. **Household survey data (N=2987)**—Population-based household survey data was collected from 2,987 heads of household in 266 communities (gantas).
2. **Wives survey (N=1507)**—The wives survey was administered to a subset of wives in male-headed households; it documents intra-household trends.
3. **Ganta leader survey (N=263)**—A closed-ended survey interview was conducted with one leader of each ganta in the study area, including elders and/or respected individuals from the ganta.
4. **Focus group discussions (N=150)**—The evaluation collected data from open-ended FGDs with women, youth, and agro-pastoralists in a subset of the gantas involved in the evaluation. Two FGDs were conducted in each of 75 gantas.
5. **Key informant interviews (N=128)**—Open-ended interviews were conducted with a number of customary leaders, including *duwa abba* (customary leader responsible for decisions about seasonal herd movements and grazing), *kedo abba* (clan leader), *dahla (gulub) abba* (sub-clan leader), *fiema abba* (responsible for rule enforcement), and *daar-idolla* (customary elders) at the clan level. KIIs were also conducted with government leaders to capture the role of local and regional institutions.
6. **Participatory mapping (N=50)**—The evaluation conducted an open-ended participatory mapping exercise with small groups of herders and scouts<sup>6</sup> in 50 gantas.

All of the original survey instruments received university Institutional Review Board (IRB) approval from Clark University and were pre-tested and piloted prior to the baseline data collection. The evaluation aims to conduct all quantitative instruments as panel surveys; this involves tracking the same respondents over time between the baseline and endline data collection. The baseline data for the evaluation was collected from March–June 2016. Detailed information about the evaluation methods and challenges encountered during baseline data collection is contained in the following section.

## PROJECT BACKGROUND<sup>7</sup>

In pastoral communities in Ethiopia and elsewhere, land is reallocated for commercial agricultural investment and infrastructure development on a regular basis. In particular, this is true of the rangelands, where external interest in land for agriculture—and in its resources for other commercial ventures, such as tourism—has grown. Pastoralists are therefore concerned about the risk of expropriation and fear losing their land due to expropriation by the state, since their migratory and herding patterns may coincide or intersect with land expropriated for commercial purposes (Hundie 2006, 2010; Cotula &

<sup>6</sup> In Afar, teams of scouts are sent out to areas to observe the state of the rangelands, effects of rainfall and the suitability for grazing (Eriksen & Marin 2011).

<sup>7</sup> Please refer to Annex I—Land Afar IE Design Report for additional background information on the LAND project.



**FIGURE I.1 THE AFAR REGION**

Vermeulen 2009). Even the most progressive policies and legislation often fail to provide adequate protection to many rangeland users and, most commonly, to the poorest and least powerful.

## THE AFAR REGION

Figure I.1 depicts the location of the Afar Region within the territory of Ethiopia. The Afar Region is part of the Great Rift Valley of Ethiopia, and it has the lowest elevation in Ethiopia and one of the lowest in Africa. The geography of Afar is characterized by arid flat lands and mountains punctuated by fertile low lands in the valleys of the region's large rivers, especially the Awash River in the south of the region.

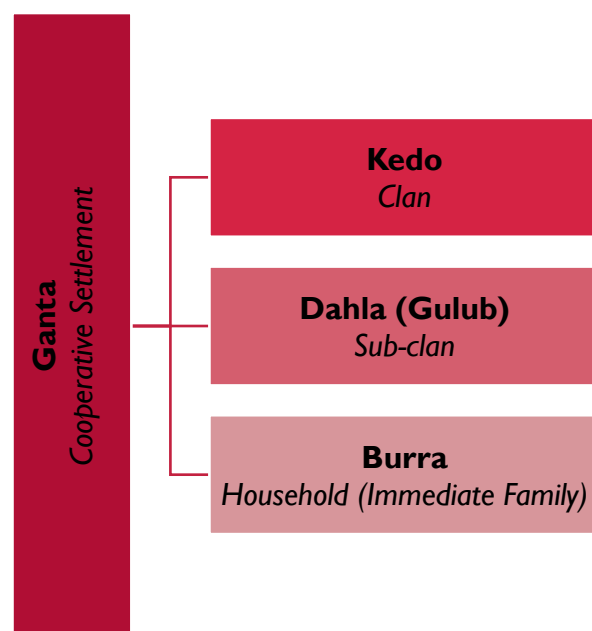
## ORGANIZATION OF COMMUNITIES IN THE AFAR REGION

The pastoralist system generally is split into two different areas of grazing based on wet and dry seasons. During the wet seasons, when most herds are moved to elevated *alta* areas to avoid floods and mosquitos, land and resource use by pastoralists is not as tightly regulated as it is in the dry season. However, those elevated areas, including mountains, border neighboring ethnic groups and often are insecure and susceptible to conflict. During the dry season, when water sources and pastures are limited, resource use is more carefully regulated and restricted. Most pastoralists move their herds to *kelo*—dry season grazing areas along the river valleys. *Kelo* areas are perceived as owned by individual clans, and only clan members have rights to use them or to allow other clans to use them (Annex I—LAND Afar IE Design Report).



The basic social structure of Afar is shown in Figure 1.2. The clan-based *kedo* is the broad basis for a grazing unit. Below the clan level, there are typically *dahla*, the lineage or extended family, and *burra*, which are the households and/or immediate family members. Members of single, and sometimes multiple, clans form cooperative settlements called *gantas*, which gather in both dry and wet season grazing areas. Composition of the *ganta* usually is not the same in the different seasons. In contrast to the dry season settlement, the *ganta* during wet seasons has no defined territory based on clan affiliation, since they often settle with other clans or close to one another for security reasons. *Ganta* boundaries and control of land is clearer during the dry season, when clan members and their herds return to their riverine lands. This seasonal distinction will need to be accounted for during the endline implementation of the *ganta*-level survey as data related to land use, management, and allocation will likely be easier to gather during the dry rather than wet season. Thus, the survey methodology calls for sampling of dry season settlements. These dynamics may also have important implications for how the LAND project documents land use rights, such as whether seasonal distinctions are incorporated into the certification process. For example, the wet season lands where there is less land pressure than along the Awash river, may need a very different certification process than in the riverine/dry season areas.

There is no single leader of the *ganta*. Rather, there are respected elders who act jointly as heads. The clan head, *kedo abba*, is the lead decision-maker when it comes to land use and use rights, including decisions about allocating land to outsiders. However, it is the clan elders, *daar-idolla*, who are able to give access to their clan's lands by giving other clans an *isso* right, or a type of lease. Sometimes clan members hold *waamo* rights to use, exclude, and/or alienate lands or resources, and they are able to hold lands and exclude other clan members from those lands (Hundie and Padmanabhan, 2008). The *fiema abba* is responsible for enforcing rules and regulations, and this customary leader works closely with other customary leaders, such as clan and sub-clan (lineage) leaders, respected elders and respected women leaders, to enforce their decisions and sanction violators. Additionally, within the *ganta*, there are chosen *duwa abbas* who manage migrations to wet season areas, thus controlling wet season mobility and its timing.



**FIGURE 1.2 SOCIAL ORGANIZATION OF AFAR PEOPLE**

## **CURRENT CHALLENGES TO LAND USE AND TENURE SECURITY IN THE AFAR REGION**

Historically, the Afar region has been populated by pastoralist communities who depend on the rainy seasons that flood perennial and seasonal rivers and create large expanses of flooded basins and pastures. These seasonally flooded riverine areas which Afar and their herds depend upon, also are of particular interest to government and private investors for their irrigation potential. To date, several thousand hectares of riverine grazing lands already have been converted to irrigated agriculture both by government and private commercial interests, including Ethiopian and foreign companies. These outside

pressures from commercial farms and land encroachment continue to diminish land availability for herders (Beyene 2012). Internally, wealthy Afar pastoralists also are enclosing large areas for cultivation. In addition, the creation of the Awash National Park and expansion of protected areas in vital flood plains has diminished the amount of land available for herding, especially critical dry season grazing areas. Alternative grazing and watering areas are no longer available or are severely limited. As a result, pastoralist livelihoods are placed under greater pressure, and herders are increasingly turning to agro-pastoral and even sedentary lifestyles. With less grazing land available, pastoralists are exposed to higher risks associated with drought<sup>8</sup>.

The Afar region is defined by one of the hottest and harshest climates on the planet. Natural factors including rising temperatures and incidences of drought, flash floods, and other extreme weather events pose a threat to local livelihoods (Adem, et al. 2010). Because most of the rivers crossing Afar originate from neighboring highland regions, livelihoods in Afar depend not only on weather conditions at the local level, but also on conditions in neighboring regions. Because of climate-related changes, as well as land use changes described above, seasonal expectations of water availability are not being consistently met; perennial rivers are not flooding; and seasonal rivers are going partially filled or empty. These patterns are in contrast to past years (EPA Ethiopia 2010, Balehegn 2013). Problems posed by land alienation are further exacerbated by increasing human and livestock populations (Reda 2014) and public infrastructure initiatives to dam rivers and divert water to large-scale irrigated projects (Behnke and Kerven 2011, 2013; Fratkin 2014). Furthermore, conflicts in these areas over scarce resources make it increasingly difficult for herds to access their normal grazing and water areas (Hundie and Padmanabhan 2008).

A more gradual but equally serious encroachment on Afar land is the spread of *P. juliflora* (regionally referred to as *woyane*) in grazing zones, which also has a deleterious effect on pastoralist livelihoods for several reasons. *P. juliflora* was introduced by the Ethiopian government in the 1980s as a vegetation cover to halt land and soil erosion in the area (i.e., to halt concerns with “desertification” in the area). Since that time the plant has rapidly proliferated and expanded into prime grazing areas, particularly flood zones that are also key dry season grazing areas, and it is now estimated to cover 3,600 square kilometers of Afar (Helland 2015:21). The proliferation of this invasive species in Amibara, one of the two woredas that is the focus of this IE, has significantly limited land available for grazing (Admasu 2008). *P. juliflora* also competes with native plants, reducing their availability for livestock to graze, and *P. juliflora* cannot be eaten by grazing animals because it causes problems for animals such as constipation, dental disfiguration and reduced overall productivity (Ibid.).

## OVERVIEW OF LAND<sup>9</sup>

The LAND project in Ethiopia is a five-year intervention (2013-2018) designed to build upon the work completed by the Pastoral Livelihoods Initiative I and the Pastoral Livelihoods Initiative II projects, and the recently-awarded Pastoralist Areas Resilience Improvement and Market Expansion (PRIME) Project<sup>10</sup>. It has been designed to strengthen the security of land use rights to promote investment and development among land users and reduce land expropriations. Based on Ethiopian constitutional

---

<sup>8</sup> Cossins (1972) points out that this has been ongoing for some time, though it is clearly accelerating. Behnke and Kerven (2013) suggest that the economics of the conversion to irrigated agriculture are not always convincing.

<sup>9</sup> From the Draft Component 4 Action Plan prepared by Tetra Tech / LAND Project—March 2014.

<sup>10</sup> More information about these related USAID-funded projects is available in Annex I—Land Afar IE Design Report.

provisions, and a regional government commitment to recognize pastoralist land use rights, the LAND Project is undertaking a focused land use rights formalization process. In Afar, the LAND project will work in coordination with activities to augment pastoral livelihoods supported by USAID's PRIME Project in Chifra and Amibara woredas<sup>11</sup>.

LAND activities will be implemented with and through the Ministry of Agriculture's Land Administration and Use Department at the national level. At a regional level, activities will be implemented with and through the regional land administration bureaus. LAND activities in Afar will be implemented under four components:

- LAND Component 1: Improve legal and policy frameworks at national and local levels;
- LAND Component 2: Strengthen capacity in national, regional, and local land administration and use planning;
- LAND Component 3: Strengthen capacity of Ethiopian universities to engage in policy analysis and research related to land tenure and train land administration and land use professionals; and
- LAND Component 4: Strengthen communal land use rights in pastoral and agro-pastoral areas to facilitate market linkages and economic growth.

Activities under Component 1 further strengthen rural land legal and regulatory frameworks developed under USAID-supported previous projects. Technical assistance under Component 2 will focus on building capacity at the national and regional levels, improving land administration services delivery, and developing land use plans using cost effective methodologies. LAND will employ a strategic mix of grants and technical assistance under Component 3 to strengthen the capacity of Ethiopian universities to develop undergraduate land administration curricula and summer short course degree programs for mid-level land administration officials to build land administration capacity sustainably beyond the life of LAND. Universities will also be supported to carry out research and evaluate Government of Ethiopia (GoE) policies promoting tenure security, increased agricultural production and food security, and sustainable management of land and natural resources.

Component 4 interventions include certification of customary land use rights, improving communal land governance, as well as strengthening pastoral communities' capacity for land use planning and management and investment negotiations. Component 4 represents the focus of the LAND Afar IE and is described in more detail below.

## LAND COMPONENT 4: INTERVENTIONS

In Afar, LAND are working with pastoral communities in the Chifra and Amibara woredas to implement Component 4, beginning in 2016<sup>12</sup>. This Component has six consecutive, often parallel tracks (activity clusters). These are:

1. **Component 4 Project Governance**—capacity building within the pastoral communities and coordination among the different players in securing pastoral land tenure;
2. **Afar Rangeland Management Systems Description, Validation, and Institutionalization**—the confirmation of PRIME-based grazing system resource and boundary

---

<sup>11</sup> USAID's PRIME Project is operating in Amibara woreda but has determined that it will not work in Chifra woreda, where a German Society for International Cooperation (GIZ) 'Capacity development for strengthening the drought resilience of the pastoral and agro-pastoral population in the lowlands of Ethiopia' intervention (2013-2018) is considered a substitute for PRIME.

<sup>12</sup> As of this report's publication, LAND consultation with communities and need identification was finalized. Communal land demarcation in Chifra is on hold pending resolution by regional officials over conflicting land use plans.

maps for grazing units within the Chifra and Amibara woredas of the Afar Region, and the institutionalization of these databases within a sustainable Knowledge Management System;

3. **Demarcation, Surveying, Registration, and Certification** of grazing units once confirmed with Chifra and Amibara customary institutions and government authorities;
4. **Development of an Afar Region Pastoralist Land Use Rights Regulation** that will acknowledge the customary systems as the basis for the formalization of land use rights.
5. **Land Use Planning and Governance Strengthening Efforts** among each of the grazing systems and *burra*.
6. **Targeted Communications**—public information and awareness activities.

LAND will work with each community to establish a Community Landholding and Governance Entity (CLGE) at the grazing unit and sub-unit levels. CLGEs will serve as the primary mechanisms to organize communities and strengthen customary institutions. The CLGE will represent the community before the government in dealings with investors and will ensure the benefits of LAND are equitably shared among all members of the community, including women and vulnerable groups, such as those transitioning out of pastoralism.

The Chifra and Amibara woredas will be the main focus of land use rights formalization, certification, boundary definition and registration for the LAND project in Afar. Additional governance strengthening, land use planning, capacity building, and outreach and extension efforts are expected to take place at the *burra* level (see figure 1.2) within the broader *kedo* (clan) systems. It is expected that the creation of CLGEs and other informal measures to strengthen land tenure security will result in improved development outcomes even if formal tenure through certification is not achieved within the lifetime of the LAND project. Refer to Annex I—LAND Afar IE Design Report for more detail about the project background.

# 2.0 EVALUATION METHODS & LIMITATIONS

## METHODS

This IE uses a Difference-in-Difference (DD) design with matching that compares outcomes in the LAND treatment woredas, Amibara and Chifra, to those measured in control woredas that are matched to the treatment woredas based on characteristics related to project outcomes (e.g. aridity, proximity to roads, incidence of *P. juliflora*, etc.).

DD is a strategy that uses data with a time and control group dimension to control for unobserved and observed fixed confounding factors, as well as observed time variant confounding factors. DD is one of the most frequently used methods for IE. In the context of the LAND Afar IE, a DD method will compare the changes in outcomes over time between the Chifra and Amibara woredas that are enrolled in the LAND project and woredas that are not involved in LAND. Given the inability to randomize the LAND project across these sites, a randomized control trial is not feasible for an evaluation of LAND. DD with matching represents the next best evaluation technique for analyzing the impact of the project. Refer to Annex I—LAND Afar IE Design Report and the 7.0 Balance and Power for a more detailed discussion of the strengths and limitations of the DD method for this evaluation.

The selection of the control group that serves as an appropriate counterfactual is critical to the validity of the study. Table 2.1 below displays the specific treatment woreda name and the two control woredas each treatment woreda is paired with. Because only some areas within each of the control woredas closely matched characteristics of the treatment woredas, two control woredas were matched with each treatment area to obtain the necessary sample size and statistical power. Figure 2.1 on the following page locates each treatment group (consisting of the treatment woreda and its two control woredas) on a map of the Afar region in Ethiopia.

**TABLE 2.1 TREATMENT AND CONTROL WOREDAS**

Treatment woredas	Matched with control woreda
Amibara	Gewane
	Delucha
Chifra	Telalak
	Dewe

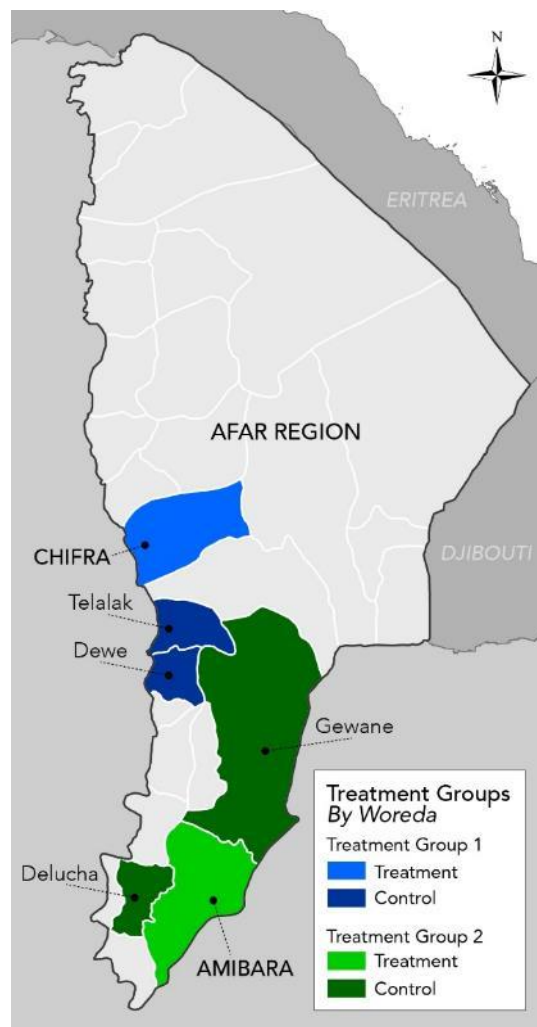
Based on the information available to the evaluation team on indicators such as aridity, proximity to roads, and incidence of *P. juliflora* from geospatial data, primary data collected during a community listing census exercise and secondary livelihood data (see Annex I—LAND Afar IE Design Report), using Gewane and Delucha for Amibara control sites and Telalak and Dewe woredas as a control group for the Chifra woreda appears to be the most suitable approach for creating counterfactuals. Amibara was paired with Gewane and Delucha because they are along the Awash river, face similar challenges and

share similar geographic features (see Annex I—LAND Afar IE Design Report). Given the small number of communities in Gewane, Delucha was added as a second control site for Amibara. Amibara and Gewane are matched in the *Namalefane Ke Baaadu* Pastoral livelihood zone<sup>13</sup>. All three sites face the challenge of *P. juliflora* and competition between irrigated agriculture and livestock production.

For Chifra, it was important to choose control woredas that lack river access and to take into account spillover between treatment and control communities in the selection of controls, either by word of mouth or movement of people from one area to another. Chifra is matched with Telalak and Dewe in the *Aramiss Ke Adaar* Pastoral livelihood zone. Given the small number of communities in Telalak, Dewe was added as a second control site for Chifra.

To strengthen the sampling process, the survey team visited every community in the prospective treatment and control areas and conducted a short survey with a community leader on key community characteristics, and collected GPS coordinates prior to baseline data collection. This data was combined with geospatial data to inform sample site selection.

The research team examined this data for potential spillover between treatment and control sites, and compared characteristics such as population size, number of female-headed households, settlement patterns, and livelihoods (see Annex I—LAND Afar IE Design Report).



**FIGURE 2.1 CONTROL AND TREATMENT WOREDAS IN THE LAND AFAR IE**

## SAMPLING METHODOLOGY

To account for the seasonal fluctuation of ganta composition, baseline data collection was conducted in gantas gathered in dry-season settlements across the control and treatment woredas. Heads of households (or *burra*), wives and ganta leaders were then sampled within each ganta.

The study aims to measure policy-relevant project effects at the level of 10-15% change for key indicators. The initial household sampling methodology to achieve these power objectives involved a large-N survey with approximately 3000 household heads across 300 gantas gathered in dry-season settlements in the control and treatment woredas. However, pre-baseline listing data collected through

<sup>13</sup> As defined by the Household Economy Analytical framework. A livelihood zone is an area within which people share geography, patterns of access to food (they grow the same crops or keep the same types of livestock), and have the same access to markets. These three factors by and large determine the economic operations of households within a particular livelihood zone, and they also determine shared vulnerability to hazards such as drought, insecurity, or market dislocation. For more information, see: <http://www.heawebsite.org/baseline-assessments>.



a community census indicated that there were well below 300 gantas in dry season settlements across the survey area.

As a result, in the Amibara, Gewane, and Telalak woredas, due to the small number of gantas in dry season settlements, all gantas were included in the sample in order to achieve the study's power objectives. In Chifra, Dewe, and Delucha, gantas were sampled from within the respective woreda using Probability Proportionate to Size sampling.

Within each ganta sampled across the study area, the study aimed to survey (1) the head of household from 10 households, (2) the ganta leader, and (3) wives from five male-headed households. In each selected ganta, 10 respondents were chosen using a Python script to randomly select from a list of all household heads collected by the survey supervisors in each village. Household respondents were stratified by female-headed and youth-headed (35 and younger, as defined by the UN) households to ensure an adequate sample of these subgroups<sup>14</sup>. Wives survey respondents were a convenience sample of the first five male-headed households where a wife was available and willing to participate and thus represents more of a qualitative or descriptive source of data.

In terms of the sampling methodology for the qualitative data collection, the FGD sampling strategy combined random selection and matching on observable characteristics in order to match treatment ganta with comparable control ganta in control woredas. FGD gantas were selected at random in Telalak (10 gantas) and in Gewane (10 gantas), and then matched to gantas in the appropriate treatment woredas based on ganta characteristics, including population and settlement patterns. After matching, the remaining ten gantas in Chifra and five gantas in Amibara were selected randomly. Key sub-groups of interest for the FGDs included women, youth, and agro-pastoralists (those who both farm and herd). Each group discussion included six to eight pre-selected participants. Participants were recruited by enumerators with assistance from ganta leaders. To encourage discussion, to the extent possible, enumerators selected participants who were of similar age and position in the ganta. Additionally, whenever possible one of the two facilitators of the FGD was a female enumerator.

Participatory mapping was implemented in 50 gantas in Chifra, Telalak, Dewe and Delucha woredas. Amibara and Gewane woredas were excluded from the participatory mapping process because previous PRIME work in the area had already captured a comprehensive mapping of the grazing areas. Using data about clans from the pre-baseline data collection exercise, participatory mapping gantas were selected based on the most prevalent clans in Chifra and Telalak. In Dewe and Delucha, where clan data was not available, participatory mapping gantas were selected at random. Each mapping exercise included six to eight participants, including at least one scout or herder, selected by the enumerators. Each mapping discussion lasted approximately 60-90 minutes in length. Participants were given colored markers and a base map of their region and were asked to draw the various grazing area and water point locations they use during the wet and dry seasons (see Figures 2.2 and 2.3). The process of constructing these maps was used as a way to help participants visualize the space they use and initiate a conversation about their resource use. Information that was drawn on the maps and their conversations about the maps were recorded and transcribed. The exercise was designed to gain local knowledge about migration patterns, grazing and water point conditions, tenure security and governance, but these maps

---

<sup>14</sup> Where possible, three of the 10 surveyed household heads were female and three were youth (35 or younger). To account for instances where this was not possible (usually because there are not enough households of that type, particularly in the case of female-headed households), these subgroups were oversampled in other gantas.

[illegible]

A group of four men are gathered around a large map spread out on the floor. They are all looking intently at the map, which appears to be a topographical or administrative map of a region. One man is pointing at a specific area on the map. The men are dressed in casual clothing, including a white t-shirt with blue stripes on the sleeves and a white tank top. The setting is outdoors, with a dirt floor and some wooden structures visible in the background.

PHOTO CREDIT: KATE MARPLE/CANTRELL / CLOUTIER/IST

A full discussion of sampling methodology can be found in the IE Design Report (Annex I—LAND Afar IE Design Report). A breakdown of the number of qualitative exercises by woreda can be found in Table 2.2 on the following page.

Impact Evaluation of the LAND Project in Afar, Ethiopia: Report on Baseline Findings (September 2016)

**TABLE 2.2 QUALITATIVE EXERCISES BY WOREDA**

	Treatment Woreda I	Controls I		Treatment Woreda II	Controls II		TOTAL
	Amibara	Gewane	Delucha	Chifra	Telalak	Dewe	
FGD	30	20	20	40	20	20	150
Participatory Mapping	0	0	10	20	10	10	50
KII	28	24	12	28	24	12	128

## BASELINE DATA COLLECTION

BDS-CDR, an Ethiopian survey firm, conducted the baseline data collection in close cooperation with ERC. Enumerator training began with a training of the trainers in Addis Ababa, Ethiopia, led by the Cloudburst Group's ERC Country Coordinator. Over four days, the project manager, field managers and survey supervisors were trained on the household survey, wives survey, ganta leader survey, sampling methodology, and electronic data collection using Survey CTO<sup>16</sup>, the survey platform selected for electronic data collection. Feedback from the training-of-the-trainers allowed investigators to improve the survey instrument and further adapt it to the local context prior to enumerator training.

Enumerator training took place over six days, and consisted of two separate sessions, one for quantitative enumerators and one for qualitative enumerators. Five days of training took place in Addis Ababa, and the final day took place in Awash Arba, Amibara. The BDS-CDR Project Manager and survey supervisors led the qualitative training, with assistance from the ERC Country Coordinator. Training included a pilot exercise in Awash Arba. Enumerators were trained on best practices for interviewing, the ethics of research with human subjects, electronic data collection devices, the household survey instrument, and the wife survey instrument. Both survey instruments were practiced in Amharic. Training contained lectures, role plays, and group exercises and provided four days for enumerators to practice the survey in small groups, share their questions and advice, and practice using Survey CTO.

Sixteen qualitative enumerators were trained simultaneously over six days, including a pilot in Awash Arba, Amibara. Six of the qualitative enumerators were female, in an attempt to ensure that women's FGDs would be led by a female enumerator. Training was led by an ERC Analyst. The qualitative team was trained in best practices for qualitative interviewing, the ethics of research with human subjects, and the various qualitative survey instruments, including KIIs, FGDs, and a participatory mapping exercise.

The field team consisted of two field managers, eight supervisors, 48 quantitative enumerators, and 16 qualitative enumerators, and the quantitative team was divided into eight smaller teams of six enumerators, at least one of whom was female, and one supervisor. The project manager worked alongside the team in Afar for the first week of data collection. Each small team was responsible for surveying one village (10 households, plus five wives) each day. Four small teams surveyed in Chifra, Telalak, and Dewe under one field manager, while the remaining teams surveyed Amibara, Gewane, and Delucha. All enumerators were fluent in English and Amharic, and the majority had at least some post-secondary education.

In line with the requirements for human subjects' protection, approval was received from the Clark University Institutional Review Board (IRB) in February 2016. Verbal informed consent was received

<sup>16</sup> <http://www.surveyccto.com/index.html>

from each participant after reading a statement about the purpose of the research, the content of the survey, any risks or benefits, and the time commitment. Participants were assured their participation was voluntary and could be withdrawn at any point and their answers would be kept confidential. They were also informed that their responses would be shared through public posting and publication in a way that protected their identities. Participants who agreed to participate in the research gave their consent orally, and consent was recorded in the electronic survey device.

Baseline quantitative and qualitative data collection took place between March 2016 and June 2016. The household, wives, and ganta leader surveys were collected through a cloud-based mobile data collection effort. Data was entered directly into Android phones using a mobile data collection platform, SurveyCTO, and downloaded and formatted into Excel spreadsheets.

## **DATA QUALITY**

The Afar baseline data collection effort utilized the following quality control measures: spot-checks by supervisors, site visits by field managers, and weekly back-checks by ERC staff. Each enumerator was spot-checked by their supervisor a minimum of five times each week, and one of those times a supervisor was present for the entire interview. Spot-checks have an accompanying checklist through which supervisors score the enumerator on a scale from 1-5 on their surveying technique, including the informed consent process, probing ability, and relationship with the respondent. The checklist was designed by ERC, and the scores could be used for positive incentives (bonuses) or for reprimanding (verbal warning, or in extreme cases, dismissal), as the firm saw fit.

In addition to supervisor checks, the field manager randomly visited each team at a survey site once a week to observe the enumerators and supervisors and confirm compliance to survey methodology. Feedback from the field manager and supervisors was continuously used to improve enumerator performance and discourage data falsification.

Finally, the most thorough checks were back-checks conducted by the ERC Country Coordinator. These checks were conducted on 100% of all household surveys using SurveyCTO, and results were compiled and shared with the survey firm daily for the first two weeks, then weekly in the remaining weeks. The back-checks compared survey responses by each enumerator to search for patterns indicating data falsification or systematic errors that should be corrected, including short survey times, missing responses, a low average number of “other, specify” responses or multiple selections, or a low average number of rows completed on each roster.

## **CHALLENGES ENCOUNTERED**

### **INABILITY TO RECRUIT AFAR-SPEAKING ENUMERATORS & TRANSLATORS**

BDS-CDR recruited enumerators from the Afar region to conduct the community listing exercise in December 2015. However, although Afar speaking enumerators were employed for the community listing exercise, the firm found it difficult to recruit a sufficient number of qualified Afar-speaking enumerators for the survey launch. BDS-CDR also experienced a variety of management problems from staff recruited in Afar, including a supervisor who was beaten in an attempted robbery by a local enumerator and difficulty ensuring data quality. For these reasons, the firm opted to recruit known enumerators from Addis Ababa, and only six of the enumerators recruited were fluent in Afar, the

language spoken in the survey area. As a consequence of this decision, both qualitative and quantitative enumerators utilized locally recruited translators to administer the survey instruments<sup>17</sup>.

Adding an additional level of complication, kebele officials in Afar insisted that translators be hired from each ganta where the survey was being administered. Kebele officials argued that benefits—in this case, salary for interpreters—should be shared by all communities equally, and refused to grant the survey firm permission to survey anywhere in Afar unless the firm agreed to hire interpreters from each ganta. To protect the confidentiality and comfort of the respondent, translators never worked in the same ganta where they lived, and respondents were asked if they knew the translator before beginning the survey. If respondents knew the interpreter, a different interpreter was arranged.

The use of interpreters posed several potential problems for data quality. First, the use of translators extended the length of the survey from 60-90 minutes to closer to 120-150 minutes, increasing respondent fatigue. The use of a translator also increased the risk of survey questions being asked inconsistently across respondents. Since translators do not have the same surveying experience nor incentive to perform well as enumerators, there was a greater risk of confidentiality being breached.

Cloudburst and BDS-CDR took several steps to mitigate these data quality concerns. Together, BDS-CDR and Cloudburst staff developed a training curriculum for translators, emphasizing survey ethics and confidentiality, and the importance of translating word-for-word and not embellishing or changing responses or questions. Translators were recruited in advance and trained by the supervisors prior to the start of data collection. The survey instruments were also shortened to the extent possible.

The research team does not have any evidence that the use of translators affected the quality of the data collection. Ultimately, 71% (N=1870) of household surveys were conducted with a translator. Translators were selected with help from local ganta leaders, but they did not conduct surveys in their own community. If translators held some bias towards portraying the government in a positive light, it would likely be biased towards the ganta level leadership of their own ganta, not the ganta where they were conducting interviews. It is highly unlikely that translators would pressure respondents from another ganta to provide more positive assessments of their ganta's leadership. Furthermore, since different translators were used in each ganta, and each translator conducted just one or two surveys on average. It is highly unlikely that each of the translators would be biased in the same way.

To further ensure that data quality was not compromised by the use of translators, tests of significance were run on a number of key land governance and tenure security indicators to see if mean responses were different between respondents who used a translator and respondents who did not use a translator. For some questions, respondents who answered the survey with a translator are slightly less likely to say their tenure is secure, the opposite of what would be seen if translators pressured respondents to provide a more favorable rating of their tenure security. For both governance and tenure security indicators, the magnitude of the differences between groups is very small, averaging 0.15 points of difference on a scale of 1-5. For all the reasons noted above, we are confident that the use of translators does not threaten the validity of the data.

For the qualitative data collection, BDS-CDR also struggled to recruit translators that were fluent in Afar to transcribe and translate the qualitative interviews, which delayed the submission of final English transcripts until August 2016.

---

<sup>17</sup> Written translations were made of the survey instruments from English into Amharic and then translated in the field from Amharic to Afar by local interpreters.

### **LACK OF FEMALE KEY INFORMANTS**

The KII sampling strategy was originally designed to include an interview with a female member of the elders' council (*daar-idolla*) in each clan where interviewing took place, but the field team found that it is exceedingly unusual for women to be members of this elders' council. Furthermore, there is no traditional role held by women in the clan governance structure. If a woman was a member of the *daar-idolla* in a clan, qualitative enumerators were instructed to interview her. This loss of key informant information from women due to the lack of leadership opportunities for women in customary governance structures is hopefully offset by the large number of FGDs conducted with women, as a women's focus group occurred in each of the 75 communities chosen for the collection of FGDs.

### **LACK OF COOPERATION FROM LOCAL GOVERNMENT**

In Amibara, the survey team was refused entry into gantas in Worer kebele by kebele officials who did not accept the authorization letters procured by the survey firm from woreda and regional government officials. A meeting was arranged between kebele officials, the BDS-CDR Project Manager, and Cloudburst staff to discuss the data collection effort, and to present the letters of authorization from the woreda and regional governments to work in the area. Permission was eventually granted, with the caveat that translators be hired from each ganta. The implication of this request is discussed in detail above.

### **DIFFICULT SURVEY CONDITIONS**

The survey team faced challenging survey conditions throughout Afar. Distances between gantas are large, and accommodations are limited, so enumerators spent many nights sleeping in the gantas in community meeting spaces, schools, and clinics. To minimize enumerator discomfort, BDS-CDR subsidized vaccinations for yellow fever for each enumerator, and provided a stipend for purchasing clean water, however, the difficult conditions lowered morale and led to high enumerator attrition rates.

As a result, BDS-CDR lost ten enumerators and one team leader in the first month of surveying, primarily due to illness and the difficult survey environment. Twelve additional enumerators were recruited and trained for five days by the BDS-CDR Project Manager and sent to join the team for data collection in Chifra. Quality control checks did not reveal any differences in the data collected by the new staff, and there is no evidence that enumerator attrition negatively affected data quality.

### **EXTREME WEATHER EVENTS**

Most surveying occurred during extreme drought conditions in the Afar region due to El Niño weather patterns, and this had been ongoing for about 18 months at the time. Then, at the end of surveying, La Niña rains began, leading to severe floods in the study area. These unseasonable rains resulted in severe flooding in Gewane that forced enumerators to leave the woreda and halt surveying for three weeks until the rains stopped and roads were passable, delaying the completion of data collection.

These extreme weather events will need to be taken into account during interpretation of findings since they may be outside of the expected range of findings for the area. In particular, reports about herd movements and migration should be understood to have been made during drought conditions, as opposed to a 'normal' non-drought year. Reports about flood damage can similarly be understood to be so numerous due to timing of some surveys immediately following a flooding event.



The study design, in particular the designation of a control group, will allow the study to distinguish which, if any, improvements in outcomes come from the LAND project, and which come from other factors, including the end of the drought. In addition, the survey asks questions specifically about household's grazing patterns in non-drought years in order to analyze how droughts impact how households utilize grazing areas.

## SAMPLE CHARACTERISTICS

The sample for the quantitative data collection includes 2,987 households, 1,507 wives, and 263 leaders. The household sample is disaggregated by subgroup in Table 2.3 below. The woreda breakdown for the sample is provided below in Table 2.4 on the following page.

**TABLE 2.3 SAMPLE SIZE BY SUBGROUPS OF INTEREST**

	Male headed household	Female headed household	Non-Youth headed household (36+)	Youth headed household (18-35)
N (%)	2217 (74%)	770 (26%)	1767 (59%)	1220 (41%)

**TABLE 2.4 SAMPLE SIZE BY WOREDA**

Woreda	Treatment	Matched Treatment	N (%)—HH	N (%)—Wife	N (%)—Leader
Amibara	Treatment	-	649 (22%)	326 (21%)	57 (22%)
Gewane	Control	Amibara	458 (15%)	228 (15%)	39 (15%)
Delucha	Control	Amibara	388 (13%)	195 (13%)	30 (11%)
Chifra	Treatment	-	885 (30%)	448 (30%)	74 (28%)
Telalak	Control	Chifra	398 (13%)	205 (14%)	42 (16%)
Dewe	Control	Chifra	209 (7%)	105 (7%)	21 (8%)
TOTAL			2,987	1,507	263

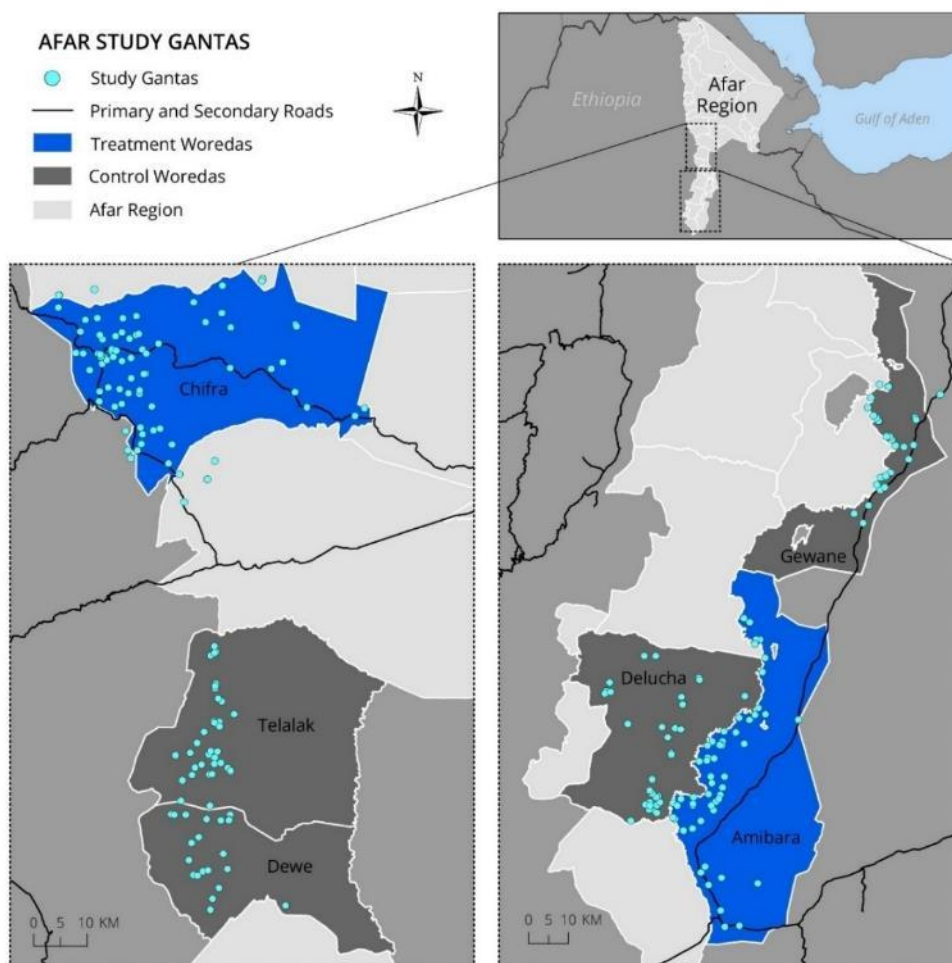
Study gantas are remote, and lack access to many basic services, including road networks, markets, schools, and clean water. Figure 2.4 shows the location of study gantas within the Afar region. On average, gantas are located 6.3km (sd=8.9) from the nearest large market, 10.0km (sd=14.4) from a tarmac road, and 10.1km (sd=13.5) from the nearest year-round water source. Afar's challenging environment is apparent in the types of problems ganta leaders identify as the most important. The most commonly identified problem is a lack of clean water (37%, N=96), followed by changes in temperature or rainfall (36%, N=95). Ganta leaders in Chifra are 14% more likely than leaders in Amibara to rate lack of clean water as their primary concern (43%, N=59). A distant third is invasive species on grazing land (8%, N=23), which is a larger concern for ganta leaders in Amibara (17%, N=21) than in Chifra (1%, N=2). These environmental challenges have large impacts on communities that depend on pastoral activities for their livelihood.

## DEMOGRAPHICS

Respondents across all woredas are similar to each other ethnically, culturally, and socioeconomically. Nearly all household and wives survey respondents are ethnically Afar (97%, N=2,883 of households; 94%, N=1,423 of wives) and Muslim (99%, N=2,961 of households; 99%, N=1,496 of wives). The average age of the head of household is 41 (sd=14), and 41% (N=1,220) of household heads are 35 years of age or younger. On average, households have five members (sd=2.21), but the largest households have up to 18 members. Thirteen percent (N=400) of household heads are polygamous married, but of polygamous household heads most have only two wives (86%, N=342).

Literacy rates are low across the sample. Only 13% of household heads can read a newspaper in any language (N=404) or write a short letter (N=397). Just 14% (N=414) of household heads have ever attended school or any other type of educational facility.

Just over half of respondents (57%, N=1,695) describe their household as fully settled, with no household members migrating with livestock during the year. Thirty-eight percent (N=1,144) of households describe their households as partially settled—some household members move during the year, while others remain in the ganta. Only 5% (N=145) of households are fully nomadic, meaning all



**FIGURE 2.4 LOCATION OF STUDY GANTAS BY TREATMENT AND CONTROL AREA**

household members move during the year to herd livestock in wet and dry season grazing areas. Households in Amibara and in control woredas are 11% more likely to be fully settled (62%, N=938), than households in Chifra and its controls (51%, N=757). This difference is significant at the 1% level ( $p=.0017$ ).

On average, households have lived in their current ganta for 29 years ( $sd=19.43$ ). The main reason respondents moved to their current ganta was marriage (35%, N=332), followed by changes in grazing patterns (34%, N=333) or moving to join relatives (12%, N=113). Less than 2% (N=14) of households moved to their current ganta as a result of a government order. Households in the Chifra area (41%, N=608), are almost twice as likely to have moved to the ganta in the last twenty years than households in the Amibara area (22%, N=332), significant at the 1% level ( $p<.0001$ ). Thus, Chifra appears to be less land constrained than Amibara, so that newly formed households have an opportunity to settle outside their natal gantas. Because access to Awash river and riverine lands is so critical and valuable in Amibara, households in Amibara likely desire to stay in their home ganta to maintain claims to *kedo* (clan) lands near the Awash river.

## LIVELIHOODS

Coupled with the baseline data on household movements, the data on household income and livelihood activities confirms that households in the study area are predominately pastoralist and agro-pastoralist.

The primary economic activity of the majority of all household members is herding livestock (36%, N=4253), followed by being a student (20%, N=2,433), domestic work (14%, N=1663), and milking livestock and caring for young animals (10%, N=1202). The primary economic activity of the majority of wives is herding livestock (43%, N=652) while approximately 16% of wives report engaging in domestic work (N=245) and another 8% of wives reported milking goats or sheep (N=117).

Households earn an average of 7,694 ETB<sup>18</sup> ( $sd=9,729$ ) and a median of 5,000 ETB<sup>19</sup> annually from all activities of all members, including livestock sales, employment, petty trade, and remittances. Unsurprisingly, female-headed households earn ~3,000 ETB<sup>20</sup> less per year than male-headed households. In the majority of households, wives identify their husbands as the main contributor to household income (76%, N=1175). However, 11% of wives report being the main income earner in their household (N=166), and 7% of wives report they are an equal contributor with their husband (N=89).

The most common source of household cash income is the sale of livestock or livestock products, especially milk. Sixty-five percent (N=1936) of household survey respondents earn some income from the sale of livestock, and those who partake earn an average of 8905<sup>21</sup> ETB a year. An additional 6% (N=163) of households earn income from the sale of livestock products. Salaried jobs (14%, N=415) and casual labor (6%, N=183) are more common than expected for a remote pastoral area and suggest that there may be family members employed outside the area who remit income. Finally, petty trade is rare (2%, N=67).

---

18 Approximately \$338 at 22 ETB to 1 USD

19 Approximately \$219 at 22 ETB to 1 USD

20 Approximately \$153 at 22 ETB to 1 USD

21 Approximately \$391 at 22 ETB to 1 USD

## LIVESTOCK OWNERSHIP

Over 90% of households own some type of livestock (93%, N=2926). As illustrated in Table 2.5, goats are the most common (88%, N=2769), and over half of the households in the sample own cattle (57%, N=1792) and sheep (57%, N=1798). Camels are less common but by no means rare (39%, N=1217). In general, households herd slightly more animals than they own, which suggests that they herd animals that belong to extended family members or other members of the ganta. Female livestock are more common than male livestock, which is unsurprising given female livestock's additional value from both milk production and the ability to provide offspring. This herd distribution pattern is the norm in pastoral livestock herds which are oriented toward milk production and herd reproduction, rather than meat production (Little et al. 2008). Wives are generally less likely than their husbands to personally own livestock. Given the importance of livestock ownership in Afar culture, this may leave women economically vulnerable, particularly in cases of divorce.

**TABLE 2.5 LIVESTOCK OWNERSHIP, BY ANIMAL TYPE (s.d. in parentheses)**

	% of households that herd or own livestock	Number of males herded	Number of females herded	Number of males owned	Number of females owned	% of wives that personally own livestock
Non-pack Camels	33% (993)	2.5 (3.21)	6.1 (6.4)	2.1 (1.9)	6.1 (6.3)	9% (138)
Pack Camels	4% (123)	2.1 (2.6)	6.1 (7.9)	2.1 (2.0)	6.3 (8.0)	
Cattle	51% (1532)	2.7 (2.9)	5.4 (5.5)	2.4 (2.0)	5.4 (5.6)	18% (278)
Goats	87% (2612)	4.4 (5.5)	15.3 (13.1)	3.8 (3.9)	15.0 (13.0)	37% (553)
Sheep	55% (1639)	3.5 (4.0)	8.8 (7.9)	3.2 (3.2)	8.5 (7.9)	18% (270)

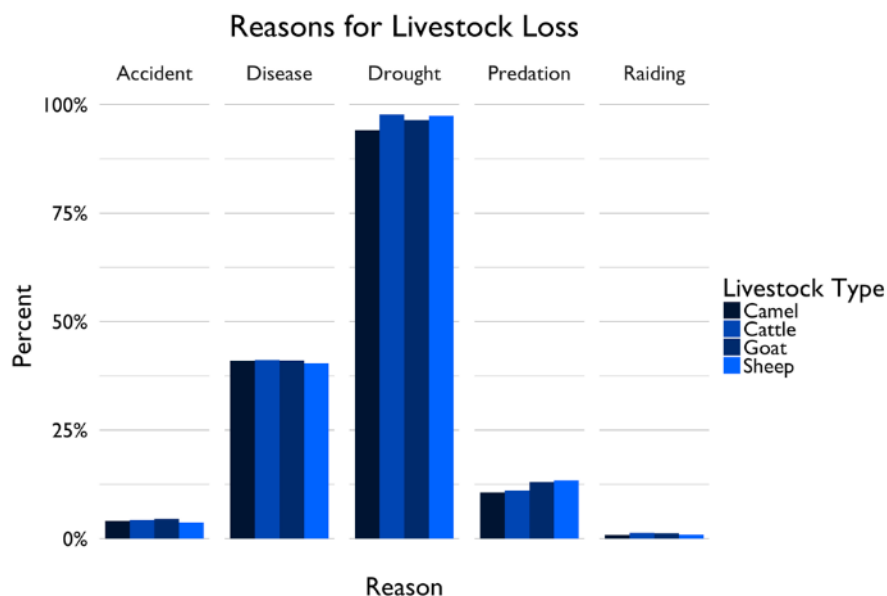
## LIVESTOCK LOSS

Eighty percent (N=2515) of households lost livestock due to disease, starvation, raiding, or other causes in the past year, and these occurrences are likely so prevalent mainly due to the severe drought. In droughts herders often find it difficult to distinguish between livestock losses due to drought/starvation and those due to disease because drought-weakened livestock are very susceptible to diseases. Three-quarters of these households lost goats (74%, N=2226), and half lost sheep (54%, N=1612) or cattle (54%, N=1608). Loss of camels, which are considerably more drought resistant than other livestock species, was less common, but still impacted over a quarter of households (29%, N=864). Figure 2.5<sup>22</sup> details the main reasons households lost livestock across all species. Starvation due to drought was identified by household heads as the most common reason across all species, followed by disease. Loss through raiding or other conflicts was very rare, affecting less than 5% of all households.

Loss of livestock is also a predominant theme in analyses of the qualitative data and was mentioned in nearly every FGD across the study area. The most common reasons mentioned for livestock loss were the ongoing drought and the resultant deteriorating rangeland conditions, mainly loss of grass and trees. Illustrative of this key theme, a group of women in Telalak detail the challenges surrounding livestock loss: "In the past we had a dry season and a wet season. In the rainy season, there was abundant rainfall so that the grass could grow. But now there is no rain and the grass does not grow. This results in the death of our livestock... Because of drought, Afar people have no livestock now."

<sup>22</sup> Percentages may not sum to 100 due to the selection of multiple reasons.

The qualitative findings further suggest that—as a result of deteriorating rangeland conditions and subsequent livestock loss—respondents in the study area are considering a shift away from livestock as the primary source of their livelihoods. For example, youth in Dewe detail: “In the past it was advantageous to raise animals. Now, those who used to raise animals are reducing them to three, four and five by selling them. Because of the dire



**FIGURE 2.5 REASONS FOR HOUSEHOLD LIVESTOCK LOSS, BY ANIMAL TYPE**

situation in which we live, people have no intention to raise animals. Before we were exerting great efforts to have a large number of animals. Today they have changed their mind due to the bad times we are living in now. Hence, they advise one another to replace their animals with other assets before they go extinct because of the recurrent drought.” Women in Amibara further illustrate this theme and suggest that the demand for assets to support alternative livelihoods—such as land for farming—may soon increase saying: “If this type of drought repeatedly happens in the coming two years, we need to sell our animals, so go from pastoralist to farmers.”

## OTHER HOUSEHOLD ASSETS AND EXPENDITURES

Table 2.6 shows common assets owned by households. The most commonly owned assets are mosquito nets (81%, N=2415), followed by machetes (66%, N=1964). A quarter of households own a mobile phone (26%, N=774).

**TABLE 2.6 HOUSEHOLD ASSETS**

Asset	Percent (Number) of households who own at least one	Mean owned (SD)
Mosquito net	81% (2415)	1.55 (.83)
Machete	66% (1964)	1.16 (.52)
Bed	62% (1850)	1.14 (.40)
Spade	47% (1415)	1.25 (.68)
Sickle	45% (1345)	1.35 (1.0)
Axe	41% (1235)	1.13 (.48)
Hoe	28% (843)	1.39 (.80)
Cell phone	26% (774)	1.14 (.56)
Radio	10% (311)	1.01 (.63)
Bicycle	2% (49)	1.94 (2.2)

Table 2.7 details common household expenses in the past 12 months. Purchasing food is far and away the largest household expense, averaging 10,710 ETB annually, or roughly 470 USD<sup>23</sup>. Livestock related expenses, including feed, water, veterinary expenses, and transport make up the second-largest category of expenses, averaging 2,204 ETB annually, or 96 USD. Healthcare expenses also account for a large share of household expenditures. It is important to note that reported household expenditures exceed reported household income. There are several possible explanations for this. First, there are cash transfer programs in the area that may account for some of the discrepancy. However, these transfers are small, usually around \$50 per household annually, and are only received by 35% of households. Another explanation is that expenditure data is often more reliable than income data, particularly if remittances are involved, so it is not uncommon to have a discrepancy between these two measures<sup>24</sup>.

**TABLE 2.7 HOUSEHOLD ANNUAL EXPENSES**

Expense Type	Mean annual expense	SD	Median annual expense	Max	Min
Drinking water	244	1,270	0	30,000	0
Food	10,710	8,636	8,400	60,000	0
Fuel (wood, charcoal, kerosene, paraffin)	437	2,433	0	48,000	0
Health (medicine, transport, tests, traditional healers)	1,882	4,505	0	45,200	0
Animals (fodder, feed, water, and transport)	2,204	4,722	0	43,200	0
School fees	799	2,728	0	30,000	0

## AID AND ACCESS TO CREDIT

The Afar region has a variety of aid programs targeted to poor households in the region. Table 2.8 details household aid received from the most common sources. Thirty-five percent (N=1036) of households receive cash from the Productive Safety Net Program (PSNP). Households receive an average of 1,216 ETB<sup>25</sup> annually. Half of those households were required to work to receive this aid (45%, N=519). Eighty-nine percent (N=1017) of household who received PSNP aid also received food aid, and nearly three-quarters of households were required to work to receive food aid (72%, N=733). Another 27% (N=806) of households receive other forms of government aid. Less common sources of aid are transfer payments or lease payments from either government or investors in exchange for land use.

**TABLE 2.8 HOUSEHOLD PARTICIPATION IN AID PROGRAMS**

Source of Aid	Percent (number) of households receiving aid
PSNP	35% (1036)
Government aid	27% (806)
NGO aid	9% (258)
Government transfer	1% (29)
Investor transfer	2% (49)

<sup>23</sup> At an exchange rate of 22 ETB to 1 USD

<sup>24</sup> Personal communication with Peter Little

<sup>25</sup> Approximately \$55 at an exchange rate of 22 ETB to 1 USD



Over half the gantas have received cash or food aid from government or non-government organizations (NGOs) specifically in compensation for infrastructure and rangeland management activities (52%, N=138). Road construction is the most common activity (42%, N=59), followed by clearing *P. juliflora* (26%, N=35), and work on water sources (17%, N=24). Food aid is the most common type of compensation provided for these activities (99%, N=138). Eighty-six percent (N=119) of ganta leaders believe the programs have been helpful for their community.

Only 6% (N=178) of households in the sample have borrowed any amount from either an informal or formal credit source. For those who have borrowed money, the most common source of loans are family members (40%, N=72), followed by informal money lenders (39%, N=69). The frequency of use of informal money lenders by some households suggests that households who want credit lack access to more formal lending systems such as banks or microfinance institutions. Less than 1% of wives (0.7%, N=11) report personally borrowing on credit from a formal institution for business or farming over the last 12 months, and only 2% (N=30) of wives reported borrowing on credit from an informal institution. Regardless, the overall demand for credit is very low.

# 3.0 FINDINGS—GRAZING AREA CONDITION

This section presents key findings about grazing practices and perceived conditions of grazing areas. Over half of the households in the sample utilize at least one grazing area outside of the ganta to graze their livestock during wet season (53%, N=1587), and just over 40% of households migrate their animals to a grazing area outside the ganta during the dry season (42%, N=1260). Chifra and Amibara woredas and their controls report similar usage of grazing areas. Households rarely need to seek permission to access either a wet or dry grazing areas, and overwhelmingly judge the current condition of grazing areas as ‘bad’ or ‘very bad’, due to poor rains, bush encroachment, and increase in human and livestock populations. Water point conditions are similarly ranked low. These trends are similar in Chifra and Amibara.

However, in Amibara, bush encroachment represents a greater threat to the quality of grazing lands, with nearly three-quarters of respondents believing the spread of *P. juliflora* is an important reason for poor conditions in their wet season grazing areas. To improve grazing conditions, some gantas participate in land management activities, including removing invasive bush species, water point maintenance, pasture seedling, and fence repair. However, there is a low level of individual participation in these activities, as rates of participation in all activities are less than 5% for household heads.

## USE OF GRAZING AREAS IN THE WET SEASON

Overall, just over half of households migrate their animals to at least one grazing area during the wet season (53%, N=1587). However, this percentage varies by woreda, from 43% of households in Dewe (N=89) to 61% of households in Chifra (N=541), as shown in Table 3.1.

**TABLE 3.1 HOUSEHOLDS WHO TRAVEL TO WET SEASON GRAZING AREAS**

Woreda	Percent (Number)
Amibara	46% (301)
Gewane	54% (249)
Delucha	56% (215)
Chifra	61% (541)
Telalak	49% (192)
Dewe	43% (89)

Most households who move their animals migrate them to a single area (83%, N=1294). An additional 14% (N=221) migrate livestock to two areas, but it is rare for households to move to their animals to three or more places (4%, N=60)<sup>26</sup>. The grazing site is a 12-hour walk on average (sd=14) from the

<sup>26</sup> Our survey instruments ask specifically about the migration of a household’s animals, instead of the household itself. For this reason, 48% of households that identify as fully settled (N=847) migrate their animals to a wet season grazing area. Households may send only some members of the household with their animals.

ganta in the wet season, and Table 3.2 shows that this average ranges from 8 hours' travel time in Gewane to 16 hours in Amibara.

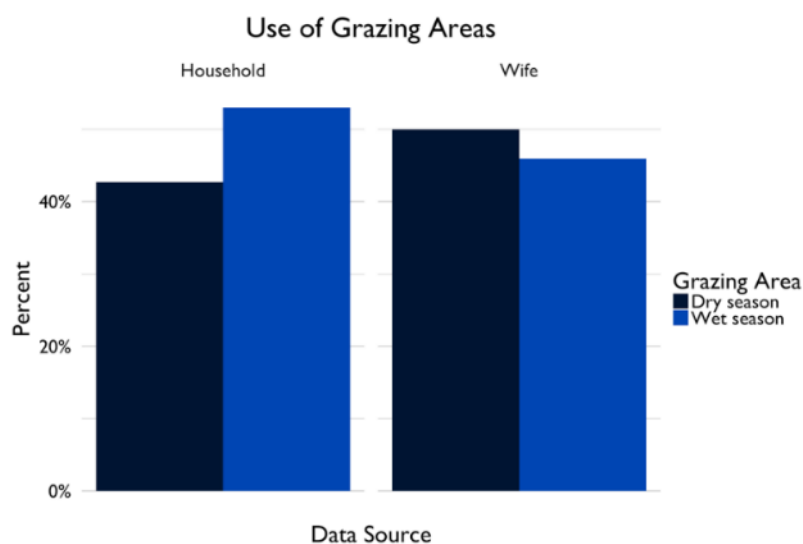
**TABLE 3.2 DISTANCE TO WET SEASON GRAZING AREA IN HOURS**

Woreda	Mean (SD)	Median
Amibara	16 (18)	7
Gewane	8 (10)	5
Delucha	8 (12)	4
Chifra	12 (15)	5
Telalak	15 (14)	12
Dewe	14 (14)	12

Households keep their animals an average of 10.6 weeks (sd=8.6) in each wet season grazing area, though there is a large difference between households in the Chifra area, who stay an average of 8.5 (sd=6.0) weeks, and Amibara, who stay nearly twice as long (13.5. sd=11.2), a difference that is significant at the 1% level. The overwhelming main advantage respondents cite about the area or areas where they choose to graze is good pasture (85%, N=1727 of wet season grazing areas).

Forty-five percent (N=302) of wives that own their own livestock report that their livestock migrate to a wet season grazing area, and 86% (N=260) of these wives do at least some of the herding of their animals personally. The percentage of livestock-owning women who also herd during the wet season is higher in Amibara and its control woredas, where 91% of wives who own livestock (N=84) herd them, than in Chifra and its control woredas, where only 84% (N=176) do the same, a difference that is significant at the 1% level.

Among households reporting they do not migrate their animals to a wet season grazing area, the most common reason reported for not doing so is small herd size (57%, N=756). Households who do not use a grazing area have herds nearly half the size (16.75 animals vs. 30.86 animals) of households that do use grazing areas ( $p<.0001$ ). This pattern holds for both wet and dry season grazing areas, and if the herd size is considered for only cattle and camel, as well as if the herd size is considered for only goats and sheep. This reason is consistent with the qualitative and quantitative findings on the experience of widespread livestock loss. For example, focus group participants consistently noted they no longer travel to wet season grazing areas because the livestock they previously owned had died and therefore there was no need for them to migrate. An additional 20% (N=250) of household survey



**FIGURE 3.1 USE OF GRAZING AREAS IN WET AND DRY SEASON**

respondents report that they do not travel to wet season grazing areas because there is sufficient water or pasture at their dry season grazing area and there is no need to migrate. Ten percent (N=136) lack enough household labor to migrate with the animals to wet season grazing areas, a problem more prevalent for female-headed households (14%, N=60) than male-headed households (9%, N=79).

Twenty-four percent (N=322) of respondents reporting they do not migrate their animals to a wet season grazing area list reasons attributable to degraded conditions of wet season grazing areas such as settlement in wet season grazing areas, lack of water or feed for animals at the grazing areas, or insufficient pasture or water at the grazing area. Lack of travel to wet season grazing areas as a result of deteriorating grazing and water conditions—mainly a lack of water and grazing and the increasing presence of invasive bush species—was also evident consistently throughout the qualitative data. For example, a group of youth in Dewe details their lack of travel to wet season grazing areas they previously traveled to due to lack of water and grazing for their animals saying, “In the past we used to go to the river bank during the rainy reason. But now the dearth of water restricted us from going there... There are so many places we don’t go for pasture. No grass is expected without rain. Both humans and animals survive as a result of water availability.”

When asked about changing water resources in wet season grazing areas over the past 5 to 10 years, a group of men in Amibara noted: “It’s different now. In the past years the river water was pure in the rainy season, but now it is polluted.” Women in Amibara similarly describe the changes they’ve observed in the Awash river: “It is the river water that we mostly see changes. During the rainy reason, we used to have a lot of river water. Now there isn’t as much water. There are times when it becomes dirty and is not suitable for camels or cattle.”

A further 10% (N=128) of respondents who did not migrate their animals to a wet season grazing area report there is no wet season grazing area at all or that it is too far. Qualitative evidence further suggests that the ongoing drought plays an important role in access to wet season grazing areas and the distance one must travel to reach them. Illustrating this theme, women in Telalak detail having to travel further distances to find adequate grazing as a result of the drought: “The grass that we were using in the past was better. Now we have no grass or trees. In the past our animals were eating enough food and there was no drought. Our animals were getting enough food in the nearest places but now even in the surrounding environments you can’t get enough food. We came here yesterday night because we didn’t get enough food, we left our places searching for grazing.”

The lack of accessibility does not appear to be related to restrictions by traditional or Pastoralist Association (PA) authorities or by conflicts, as restrictions by either type of authority are incredibly rare in both the quantitative and the qualitative data.

## USE OF GRAZING AREAS IN THE DRY SEASON

Fewer households migrate their animals to dry season grazing areas than to wet season grazing areas (42%, N=1260). Table 3.3 on the following page displays these summary statistics by woreda. Similar to practices during the wet season, female-headed households (34%, N=259) are less likely than male-headed households (45%, N=1001) to migrate their animals to dry season grazing areas<sup>27</sup>, and

---

<sup>27</sup> Significant at the 1% level,  $p < .0001$

households in Chifra and its controls are much more likely to do so (54%, N=810) than are households in Amibara and its controls (30%, N=450)<sup>28</sup>.

**TABLE 3.3 HOUSEHOLDS WHO TRAVEL TO DRY SEASON GRAZING AREA**

Woreda	Percent (Number)
Amibara	25% (160)
Gewane	29% (137)
Delucha	37% (153)
Chifra	54% (479)
Telalak	51% (204)
Dewe	61% (127)

Among households that do migrate their animals to a dry season grazing area, 87% (N=1100) migrate to a single area and the average grazing site is a 30-hour walk (sd=78) from the ganta, though as Table 3.4 displays, this average is much higher in Amibara and much lower in Gewane. These longer than expected travel times may be due to the drought, which forced many of them to move their animals to highland areas in neighboring Amhara and Oromia regions, which is a common coping strategy during bad droughts.

**TABLE 3.4 DISTANCE TO DRY SEASON AREA IN HOURS**

Woreda	Mean (SD)	Median
Amibara	40 (72)	12
Gewane	10 (18)	3
Delucha	16 (34)	4
Chifra	38 (99)	6
Telalak	23 (59)	11
Dewe	30 (52)	10

Just like respondent assessments of wet season grazing areas, the main advantage respondents cite about the area or areas where they choose to graze in the dry season is good pasture (82%, N=927).

Roughly half of wives who own livestock (50%, N=142) affirm that animals they personally own migrate to these dry season grazing areas. Among wives reporting that animals they personally own migrate to dry season grazing areas, almost all (92%, N=130) report they themselves herd the animals. Women in Chifra, Telalak, and Dewe (61%, N=113) are more likely than women in Amibara, Gewane, and Delucha (29%, N=29) to state that the animals that they personally own migrate to dry season grazing areas.

Among households reporting they do not move their animals to dry season grazing areas, the most commonly reported reason remains their small herd size (49%, N=811), though households are more likely to cite the reason for not migrating as degraded or insufficient grazing areas during the dry season (32%, N=532) than they are during the wet season. Conflicts and restrictions by authorities remain rare.

The qualitative findings also attribute small herd size and deteriorating rangeland and water resource conditions as the primary reasons respondents in the survey area do not travel to dry season grazing

<sup>28</sup> Significant at the 1% level,  $p < .0001$

areas. Focus group participants consistently noted they no longer travel to dry season grazing areas they previously traveled to in the past 5 to 10 years, either because the livestock they previously owned has died due to lack of rain and grazing, or—for those with livestock—because of a lack of water and a lack of grass and trees for their animals. For example, when asked about why they no longer travel to dry season areas, a group of men in Amibara note: “Now in the dry season, livestock do not get enough grass and water. Instead of increasing, the number of livestock decreases. We face many problems...Our livestock are already destroyed, what remain are goats and sheep, others are destroyed. We have not moved in 5 years.”

Similar to the quantitative findings, lack of travel to and use of dry season grazing areas due to formal government or customary authority restrictions was rarely mentioned in FGDs.

**TABLE 3.5 HOUSEHOLD REASONS FOR NOT MIGRATING TO A GRAZING AREA**

Reason	Wet	Dry
Small herd/have no livestock	51% (678)	49% (811)
No water or feed for animals at grazing area	17% (234)	21% (366)
Sufficient pasture or water at ganta	20% (250)	13% (211)
Insufficient pasture or water at grazing area	15% (207)	23% (347)
Insufficient labor	10% (136)	11% (188)
No grazing area/it is too far	10% (128)	14% (234)
Settlement in grazing area	<1% (6)	<1% (4)
Conflict with another ethnic group	1% (9)	1% (12)
Restrictions by traditional authorities	<1% (1)	<1% (4)
Restrictions by kebele authorities	0% (0)	0% (0)
Conflict with other households in my clan	0% (0)	<1% (1)

## MIGRATION

Less than a fifth of household survey respondents ask for advice about migrating their animals during the wet season (14%, N=232) or dry season (12%, N=144). Herders and scouts are by far the most common source of advice. Half (N=122) of all households that seek advice during the wet season do so from herders and scouts, and nearly half of households seek advice from them during the dry season (46%, N=64). Customary leaders, including the *duwa abba*, clan and subclan leaders, and the *fiema abba* are consulted by 33% (N=80) of households who seek advice in the wet season and 32% (N=47) of households who seek advice in the dry season. Unsurprisingly, the *duwa abba*, who is responsible for rules regarding grazing, is the most likely of the customary leaders to be consulted. PA officials are rarely approached for grazing advice during the dry season (3%, N=4), but 11% of advice-seeking households (N=27) ask for PA officials’ input on grazing conditions on wet season land.

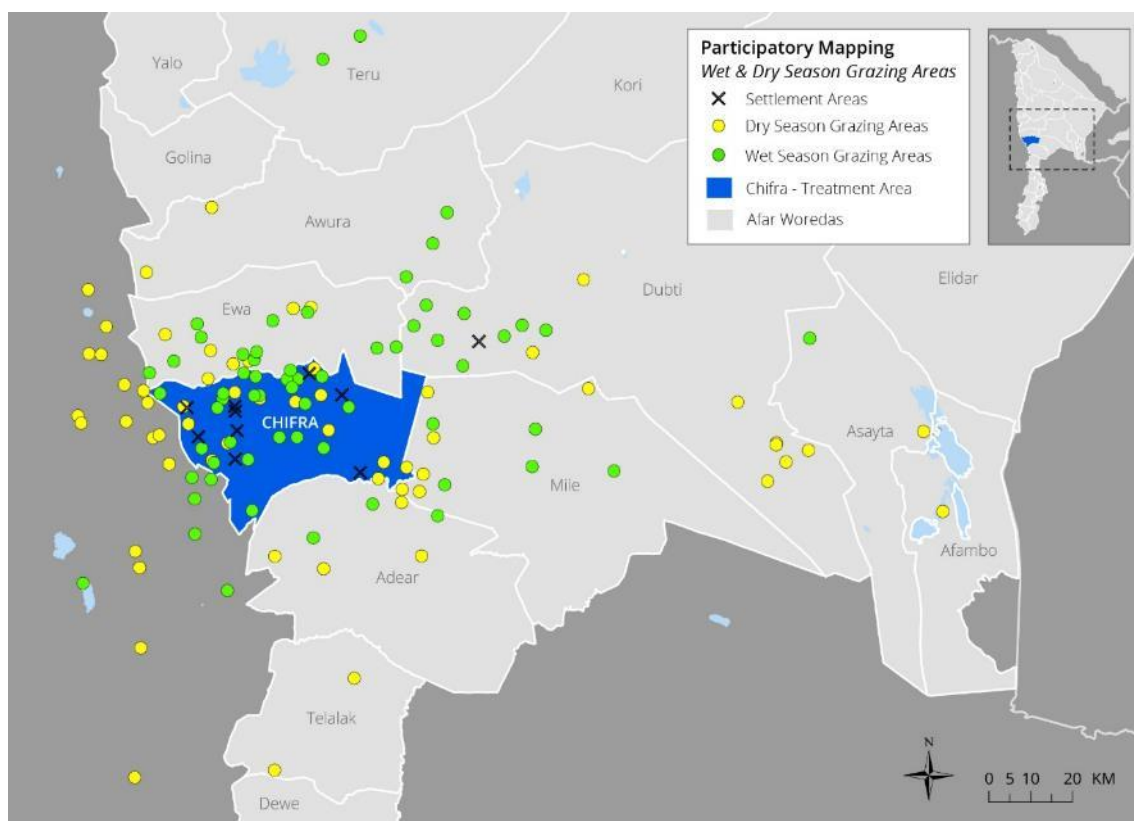
According to participatory mapping data, migration routes vary across the woredas, taking anywhere from 3 hours to 15 days depending on grazing and water point conditions, longer than the average migration time noted in the household survey. In Chifra, gantas travel in every direction, but most seem to migrate to grazing lands and water points that are in the west and in the east at higher elevations<sup>29</sup>.

<sup>29</sup> Respondents noted the presence of grazing lands in Amhara region, as well as in the opposite direction into Aysaita. Even gantas that were once permanently settled indicate traveling during the dry season, including outside Afar such as Oromia and Amhara. One ganta notes that they migrate to Amhara if there is not enough rain for the “grass to grow tall”, which is often during dry times between March and July. Another Chifra ganta also notes that during drought times they “migrate to Afar to feed animals the grass called Mussa...[it’s] very far from

Several gantas also mention that they split up sometimes when they travel because they take different animals to different places. They also suggest that they migrate in “different directions” for water than they do for grazing<sup>30</sup>.

However, not all ganta heads report that members migrate across Afar. One ganta head in Telalak says that in the dry season “there is a river that flows so we don’t migrate anywhere...we stay in our land, except some guys who migrate to We-aytu specially a place called Asbole.”

During the participatory mapping exercise, participants were asked to draw the locations of grazing areas and water points during the wet and dry seasons on a map. Ten maps were selected from the Chifra mapping exercises and were digitized to better understand the range of wet and dry season grazing areas and water points (See Figures 3.2 and 3.3). Consistent with the quantitative survey findings, the dry season grazing areas are farther away from the settlement locations in Chifra compared to the wet season grazing areas. Wet and dry season water point locations correspond to the approximate reported locations for grazing areas.

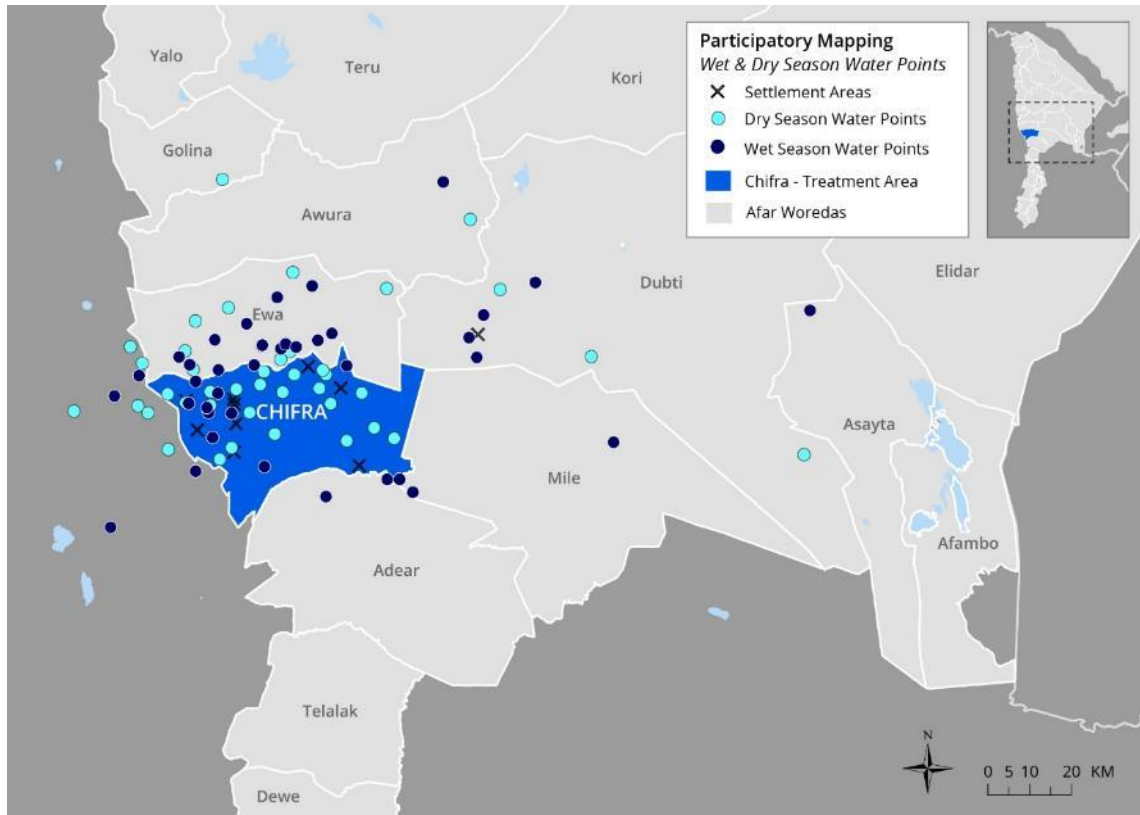


**FIGURE 3.2 WET AND DRY SEASON GRAZING AREAS**

us, the road [takes] 15 days.” Some gantas in Chifra also spoke of other ethnic groups such as Oromia and Amhara in addition to people from Asayita migrating to the areas that they use for grazing.

30 Another ganta in Dewe notes that migrate to woredas throughout Afar, they note that they specially travel to Oromia during the dry season. Their grazing areas are located in their kebele (1 day), Dewe (3 days), and Oromia (3 days). Some other grazing areas called “Magenta” (8 days) and “Weaytu” (1 week) are the farthest away from where they are located in Dewe.





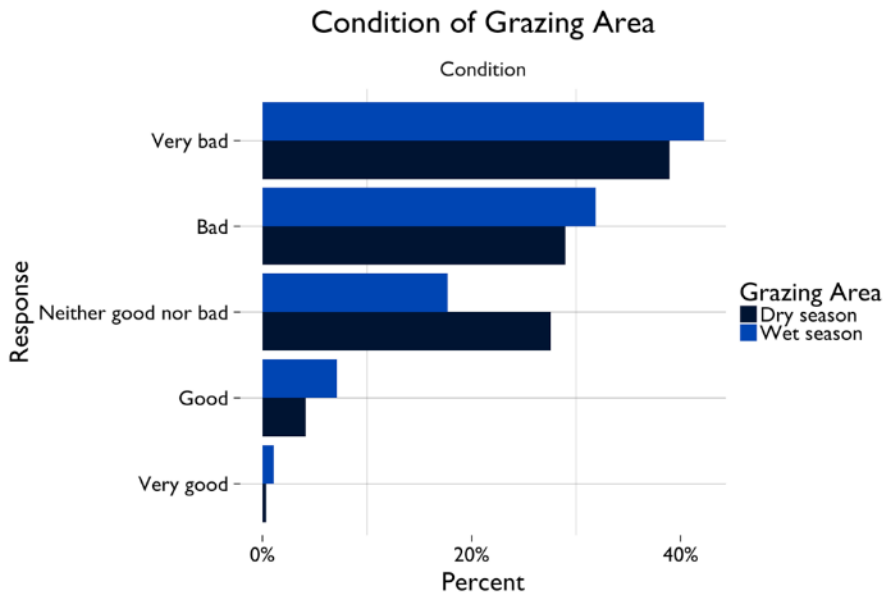
**FIGURE 3.3 WET AND DRY SEASON WATER POINTS**

## CHANGES IN CONDITIONS OF GRAZING LAND

Ganta leaders are pessimistic about the current condition of the communal grazing areas that their gantas access. The overall condition of over three-quarters of grazing areas is described by ganta leaders as 'bad' or 'very bad' (77%, N=464), and nearly half report that the size of the area has decreased (46%, N=276).

Similarly, household and wives survey respondents emphasized the poor condition of their wet and dry season rangelands. These results are not unusual given the drought conditions during the survey. Three-quarters of households ranked their wet season grazing area as 'bad' or 'very bad' (74%, N=1419), and the dry season graze land conditions are similarly likely to be described as 'bad' or 'very bad' (68%, N=764). Household survey respondents' perceptions of the conditions of wet and dry season grazing areas are displayed in Figure 3.4. As discussed above, these findings could be atypical because of drought.

As shown in Figure 3.5, the most common rationale for the poor condition of household's grazing areas in both wet and dry season is lack of rain, which implies the influence of the ongoing drought (Wet season: 94%, N=1323; Dry season: 92%, N=702), followed by soil erosion (WS: 62%, N=885; DS: 63%, N=484) and the encroachment of invasive bush species such as *P. juliflora* (WS: 54%, N=770; DS: 44%, N=348), which is described in more detail below. Approximately a quarter of the sample cited the expansion of agriculture<sup>31</sup> and population growth of humans<sup>32</sup> or livestock<sup>33</sup> as factors contributing to the degradation of grazing land. Only households who migrate to a grazing area were asked about reasons for deteriorating grazing area conditions. Households who believe that an increase in livestock population is a reason that their grazing areas, both wet and dry, are deteriorating have larger herd sizes on average (30.86 livestock) than households who do not believe increased livestock population is

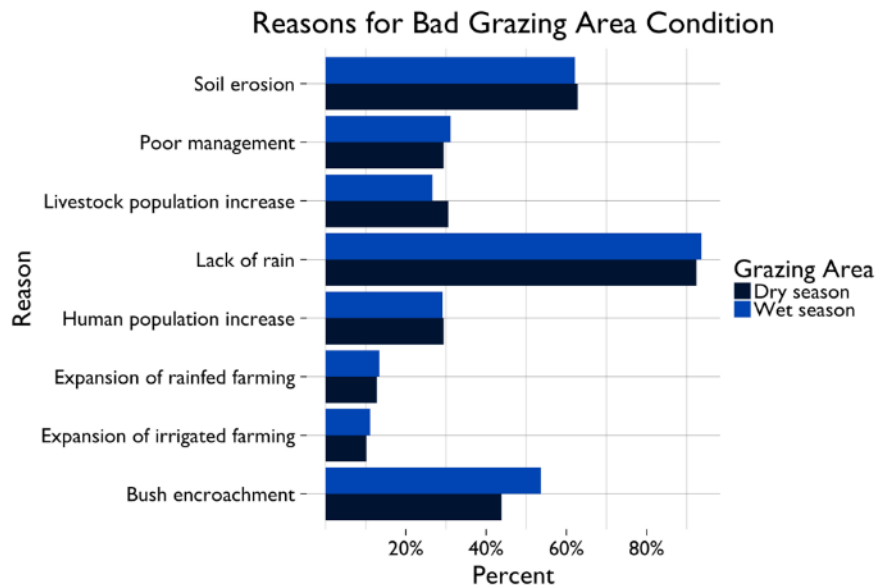


**FIGURE 3.4 HOUSEHOLD ASSESSMENT OF GRAZING AREA CONDITION**

31 Wet season: Rainfed agriculture 188, 14%; Irrigated agriculture 155, 12%. Dry season: Rainfed 95, 14%; Irrigated 80, 11%

32 Wet season: 384, 29%; Dry season: 199, 29%

33 Wet season: 349, 26%; Dry season: 206, 29%



**FIGURE 3.5 HOUSEHOLD REASONS FOR DEGRADED GRAZING AREA CONDITIONS**

harming grazing lands (16.75 livestock;  $p < .0001$ ). This finding is not surprising since those with larger herds are likely to depend more on pastoralism than others and, thus, a deteriorating resource base will have a greater impact on their livelihood than it will for others.

The qualitative data complement these findings, as the condition of both wet and dry season grazing areas is consistently described across the study area as deteriorating due to a lack of rain and the resultant loss of grass and trees.

For example, a focus group of women in Amibara details the challenges surrounding rangeland conditions: “[Following] the rain grass used to grow there, and also the plain used to flood with river water and salt. Livestock used to enjoy a good time there during summer, enjoying tasty grass that was useful for animals. Those places now are turned to dust.” Women in Chifra also describe: “During the previous seasons there was grass. Our animals had grass to eat and there was rain. But now there is no grass, we have been having bad seasons. If there is no rain, there is no birth and so there will be less animals. We are in drought”

All participatory mapping participants report that grazing areas have been “decreasing more and more” over the years. This decrease is not in terms of actual land coverage, but the quality of the land they can use for grazing purposes; “yes we have land, but that land doesn’t have grass.” One ganta in Chifra notes that the grass that they use to feed their livestock has been disappearing. “Before 10 years, in Afar land, there was a lot grass, but after 5 years, nothing is available... both the grass and plants have disappeared, for example the plant called, Madera and Kusra.”

Besides the general drought conditions, mapping participants across all the woredas noted several reasons for the decrease in different grass species on their grazing lands. For example, members of gantas in Dewe said that their grazing areas decreased due to “the harmful insect” which “eats the roots of the grasses” and is “dangerous for the fertility of the grasses.” This insect was not mentioned by

other gantas in other woredas, suggesting this could be a problem that is unique to the Dewe area or is particularly prevalent in this area.

Furthermore, participants in other gantas in Chifra report flooding as a source of “countless damage” to the grazing lands. “The flood damaged the pastureland and waterholes; no grass is grown now.” Another participant noted that their farmlands have also been flooded; “what grieves us is the farm land that has been damaged by flood... We suffer a lot as a result of the lands damaged by floods.” These responses were a reaction to the recent flooding and do not indicate that this is a common source of damage to their grazing lands.

## **WATER POINTS**

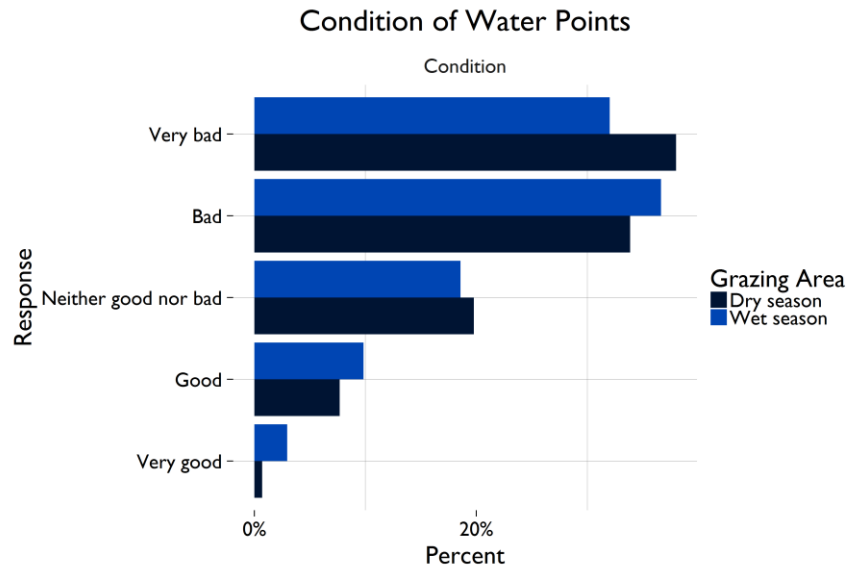
Water condition and availability are extreme problems in the Afar region and among the key reasons gantas migrate to other areas across all four woredas. Conversely, insufficient water also represents the primary reason for not traveling to grazing areas or as a reason for restricting access to certain areas. From the mapping exercise, participants highlight the importance of mobility in searching for water sources such as wells/pumps, rivers, ponds, and canal water for both human and animal consumption. “We don’t know how [to] overcome [the water problems], but we will move to the places that have water”.

Gantas across all four mapping woredas report using a variety of water sources depending on the season. In Delucha, most gantas use water from the Awash River for both animal and human use. One ganta in Delucha explains that they also get tap water in some areas and in others they “drink water that comes on motorbikes.” Gantas in Dewe also listed several rivers that they access depending on the time of year including Dewe River, Qasboli River, Awash River, Taffa River and Adali River. Another respondent noted that they use river and well water in the dry season and exclusively wells in the wet season. In Telalak, almost all the gantas said they have access to well water, but almost all use river water as well. One ganta mentioned that they built their own well, but that the water only lasts three to four months.

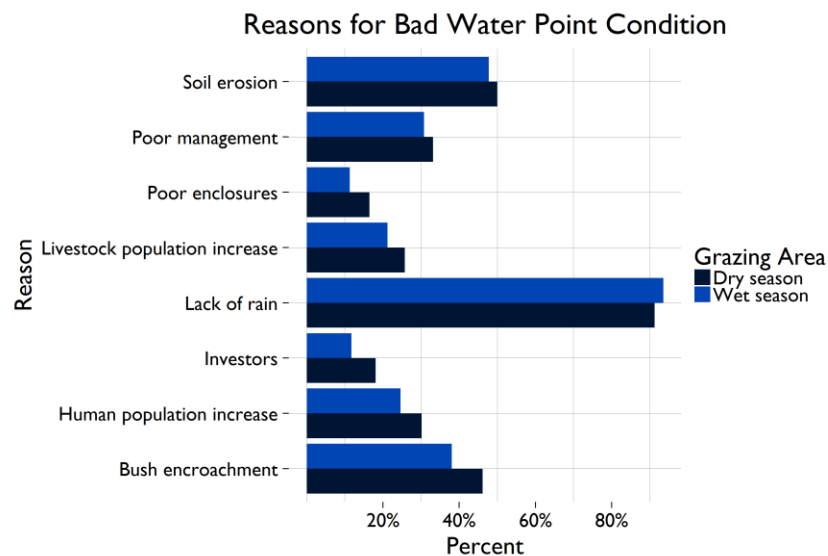
In the quantitative surveys, wives were asked to assess the condition of water points in their wet and dry season grazing areas<sup>34</sup>. Similar to perceptions of the grazing areas overall, wife survey respondents believe that water point conditions are ‘bad’ or ‘very bad’ in both the wet season (68%, N=676) and the dry season (71%, N=708) grazing areas. The condition of water points in the dry season grazing areas is rated slightly worse than the conditions of wet season water points, as illustrated in Figure 3.6, but the magnitude of the difference is quite small and likely attributable to the drought. Like grazing areas as a whole, the major reasons wives cite for the poor condition of their water points are lack of rain (Wet season: 94%, N=632; Dry season: 92%, N=646), erosion (Wet season: 48%, N=324; Dry season: 53%, N=364), and the encroachment of invasive bush species (Wet season: 38%, N=254; Dry season: 47%, N=331), detailed in Figure 3.7. Compared to the reasons for poor rangeland conditions, increases in human and livestock population appear to put greater strain on the water points than the grazing areas overall.

---

<sup>34</sup> The condition of the water point refers to the quality of the water point itself, not the quality of the water. Examples of poor water point conditions include wells that have dried up or wells that are poorly maintained or managed.



**FIGURE 3.6 ASSESSMENT OF WATER POINT CONDITIONS, WIFE SURVEY**



**FIGURE 3.7 REASONS FOR BAD WATER POINTS CONDITIONS, WIFE SURVEY**

The lack of water and condition of the water points has a variety of impacts. Data obtained from mapping exercises and FGDs highlight that not only has the quantity of water available throughout the study area decreased, the quality of water in terms of cleanliness and potability is also deteriorating. This change is largely attributed to lack of rain by respondents, which is unsurprising as most of this data was collected during an extreme drought. The resulting changes in access to clean water represent threats to both humans and livestock.

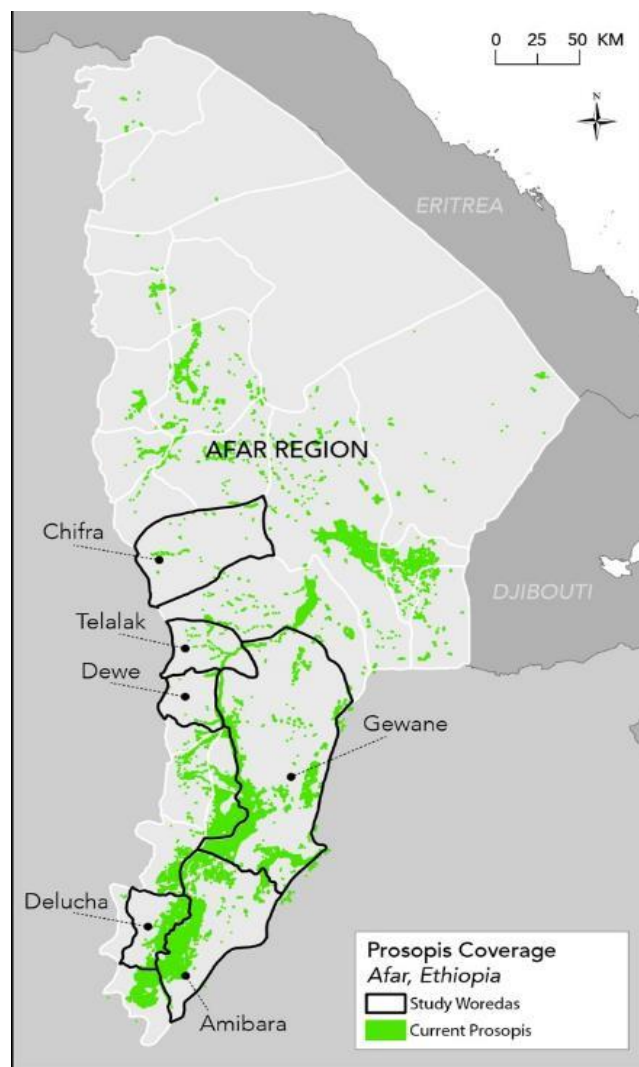
One mapping respondent from Chifra notes that they get “unsafe water, which [is] not good for health.” Even when using well water, gantas still report that the water is unclean; “wells have little water and it is not pure because of lack of rain,” which causes sickness in the animals. This is most likely a problem with salinity of the water, which is common in wells in Afar.

Women in Delucha detail the challenges livestock face due to the lack of clean water sources: “Because of the lack of water supply and sanitation problems, cattle face big problems, like increasing mortality rate of animals. When they drink dirty water they catch water borne diseases”. Gantas across all four mapping woredas mentioned that their livestock are suffering from poor water conditions; “we are drinking from small ponds, when these ponds dried, we are going a long distance on the road in order get water. Due to these conditions so many animals died due to lack of water.” During droughts the little water available in existing ponds is excessively full of animal waste, silt, and sodium (salt) and is unhealthy for both animals and people.

### INVASIVE BUSH SPECIES AND *P. JULIFLORA*

The spread of *P. juliflora* (regionally referred to as *woyane*) in grazing zones poses a serious threat to the condition of grazing lands in Afar, particularly in Amibara. Figure 3.8 illustrates the presence of *P. juliflora* throughout the study region. The proliferation of this invasive species limits available land, and it has had multiple additional negative effects associated with it (Admasu 2008). The fruits of the plant are edible and even nutritious, but most of the plant is unpalatable, and the seeds have been reported to cause neurological sicknesses and teeth problems in animals. Otherwise, *P. juliflora* can be burned and used for charcoal, and the wood produces a good quality timber with desirable color, hardness, and shrinkage values (Wakie 2012). However, because of its sturdy nature, the harvesting of *P. juliflora* usually requires power-driven saws and other equipment which most pastoral communities lack, and cutting trees without official approval can cause problems in communities.

Over half (54%, N=770) of household survey respondents believe that the presence of *P. juliflora* in their rangeland is an ‘important’ or ‘very important’ reason that their current wet season grazing area conditions are poor, and 44% (N=348) believe it is a cause of poor conditions in their dry season grazing areas as



SOURCE: USAID PASTORAL LIVELIHOODS INITIATIVE II

**FIGURE 3.8 PRESENCE OF PROSOPIS JULIFLORA IN AFAR REGION**

well. Of the small number of households who have seen their access to a grazing area restricted, twelve cite invasive bush species as a reason for losing access to a wet season grazing area, and three state *P. juliflora* is as a reason for lost access to a dry season grazing area.

Mapping participants spoke in detail about the spread of *P. juliflora* and other invasive species<sup>35</sup>. The negative effects of invasive bush species are particularly evident throughout the qualitative data from Amibara, Gewane, and Delucha, as focus group participants consistently highlight the spread of *P. juliflora* as a threat to livestock. For example, a group of women in Amibara stated: “The useless brambles which grow in our areas are *woyane*. It affects all of our animals either directly or indirectly. When the animals eat *woyane* their milk and meat becomes sour. Sometimes when they eat *woyane* they die.”

On the other hand, clearing brush like *P. juliflora* from grazing land does seem to improve the condition of grazing land. A third of households (39%, N=62) who believe their wet season grazing land is in good condition believe that bush clearing efforts are an important reason why the land condition is favorable, as do 35% (19) of households who believe their dry season grazing land is in good condition. This suggests that expanding community bush clearing efforts, like those described in Table 3.6 and Table 3.7, may have a favorable impact on overall grazing area conditions in Afar.

## CONTRIBUTIONS TO CARE OF GRAZING LANDS & WATER POINTS

Enclosed communal grazing areas, called *desso*, are becoming more common as communities attempt to better manage their rangeland, limit access to outsiders, and internalize the value of these lands. Thirty-four percent of gantas (N=89) use at least one grazing area that has been enclosed specifically for community use. On average, each ganta uses two enclosed grazing areas (sd=1.5), with an average size of 352 ha (sd=1084). Sixteen percent (N=26) of enclosed grazing areas were established with the assistance of the government or a NGO.

Since enclosing these grazing areas, there have been limited community efforts at improving the enclosed areas, detailed in Table 3.6. The most common improvement made is bush clearing (37%, N=62). The second most common improvement made is fencing improvements (22%, N=37).

**TABLE 3.6 GANTA-LEVEL DESSO MANAGEMENT ACTIVITIES**

Land management activity	No	Yes
Removed invasive bush species	63% (104)	37% (62)
Improved fencing	75% (128)	23% (37)
Improved water management	84% (136)	16% (27)
Planted supplementary sources of forage and food for livestock	88% (143)	12% (20)

Table 3.7 breaks down household head and wives reported contributions of time and money towards various grazing area improvement projects. Less than 3% (N=52) of households have made a monetary contribution towards any maintenance or improvement activity of wet season grazing areas, including water point maintenance, pasture seeding, bush clearing, or fence repair. The most common activity households gave money for is bush clearing (1%, N=27) giving an average of 200 ETB<sup>36</sup> (sd=242)

<sup>35</sup> This study also found that many participants also commonly refer to *prosopis* as ‘democracy’ because, as was stated in one mapping exercise, “it comes [came?] in the time of democracy” (1990s).

<sup>36</sup> Approximately 9 USD at 22 ETB to 1 USD



annually. Households have similar low contribution levels towards dry season grazing area maintenance. Four percent (N=40) households make any monetary contribution, and those that do are most likely to contribute to water point maintenance (2%, N=24). However, the average amount of money given per year is incredibly small, just 12 ETB<sup>37</sup> (sd=14).

Labor contributions towards the upkeep or improvement of grazing lands are slightly more common, but by no means widespread. Six percent (N=123) of households made some sort of labor contribution to their wet season grazing area, averaging 28 person-days per household (sd=55). Just as was the case for monetary contributions, households were most likely to volunteer their labor for bush clearing (4%, N=76), followed by maintenance of water points (2%, N=49). Two percent (N=21) of households contributed any type of labor on their dry season grazing area, though the total number of person-days these households contribute is much larger during the dry season, averaging 124 person-days per household (sd=153). Households are equally unlikely to volunteer their labor clearing bush or conducting water point maintenance (2%, N=9).

Respondents to the wives survey rarely participate in protection or conservation of wet season grazing areas. Seven percent of women who access a wet season grazing area (N=57) have contributed labor or money to the protection or conservation of wet season water points. This is more common in Chifra and its controls (10%, N=44) than in Amibara and its controls (4%, N=13), significant at the 1% level ( $p<.0001$ ). Only 2% of women have contributed labor to pasture seeding (N=42), fence repair (N=25), or bush clearing (N=30) in the past 12 months, and even fewer women contribute cash toward these activities.

Participation by wives in the protection or conservation of dry season grazing areas is also very uncommon. Five percent of women accessing a dry season grazing area (N=12) have voluntarily invested time, effort or cash for the protection or conservation of dry season water points, and there is no statistically significant difference between treatment areas. Only 2% of respondents have contributed labor to pasture seeding (N=6) or fence repair (N=5) in the past 12 months, only 1% contributed labor to bush clearing (N=3), and even fewer contributed money toward these activities. These low rates of participation by women align with expectations, as it would be unusual for women to personally engage in this work or contribute their own (as opposed to their household's) money to such investment activities.

**TABLE 3.7 CONTRIBUTIONS TO GRAZING AREA MAINTENANCE**

	Water point maintenance		Pasture seeding		Fence repair		Bush clearing	
	Money	Labor	Money	Labor	Money	Labor	Money	Labor
<b>Household</b>								
Wet season	1% (25)	2% (49)	<1% (8)	1% (25)	1% (11)	2% (44)	1% (27)	4% (76)
Dry season	2% (24)	1% (9)	1% (8)	<1% (4)	2% (17)	<1% (5)	1% (18)	1% (9)
<b>Wives</b>								
Wet season	1% (22)	3% (53)	1% (10)	3% (42)	<1% (5)	2% (25)	<1% (4)	2% (30)
Dry season	1% (7)	5% (34)	0% (0)	2% (6)	0% (0)	2% (5)	<1% (2)	1% (3)

<sup>37</sup> Approximately 0.5 USD at 22 ETB to 1 USD

# 4.0 FINDINGS—TENURE SECURITY & ACCESS

This section outlines important findings about perceived tenure security of grazing areas at present and into the future. In general, households, wives, and ganta leaders feel their land use rights are secure, though respondents in Chifra and its controls report less security of tenure than those in Amibara and its controls. Less than 10% of households or wives believe their wet or dry season grazing areas could be encroached upon by any actor, including customary leaders, investors, or members of outside clans. Respondents report similarly high levels of perceived security about their water points. The greatest perceived threats to tenure security come from the national government and outside investors, but the magnitude of the threat is still negligible. Gantas in the Chifra area are more concerned their land will be given to investors by the national government than gantas in the Amibara area, despite the relative rarity of investor presence in the Chifra area. These findings with respect to tenure security indicate that the project may only lead to marginal increases in perceived tenure security, as there is relatively little room for improvement.

Customary leaders are more likely to consult with the community about water point access in the Amibara area than they are in the Chifra area, though both areas are equally likely to include women in their consultation. Restrictions resulting in lost access by gantas to wet and dry season grazing areas are incredibly rare, impacting just 3% of gantas, are most likely to be imposed by customary leaders as opposed to governments or investors, and are equally likely to occur in both the Chifra and Amibara areas.

Agricultural cultivation activity is practiced in the study area, particularly in Amibara and its controls, where nearly half of respondents cultivate or own farmland, but the uptake of agriculture does not appear to come at the expense of households' access to land or water. Only 5% of households (N=156) report any instances of grazing land being reallocated for farmland.

## TENURE SECURITY—GRAZING AREAS

As shown in Table 4.1, more than 80% of households 'agree' or 'strongly agree' that the boundaries of their grazing lands are clear and respected. Seventy percent of households feel that neither the government nor investors can take any part of their grazing area without negotiation and fair compensation. There are no discernable differences in perceived tenure security of the wet or dry season grazing areas by treatment area, gender of household head or age of household head.

Respondents to the wives survey are similarly likely to believe their grazing area is secure. Seventy percent of wife survey respondents 'agree' or 'strongly agree' that the boundaries of their grazing lands are clear and respected, and similar percentages agree that neither the government nor investors can take any part of their grazing land without negotiation and fair compensation. However, wife survey respondents in Amibara and its controls are considerably more likely to agree with these statements

about their wet season grazing area (77%, N=573; 78%, N=581; 77%, N=575,) than wife survey respondents in Chifra and its controls (63%, N=474; 62%, N=471; 63%, N=481).

**TABLE 4.1 HOUSEHOLD AND WIVES PERCEPTIONS OF GRAZING AREA SECURITY**

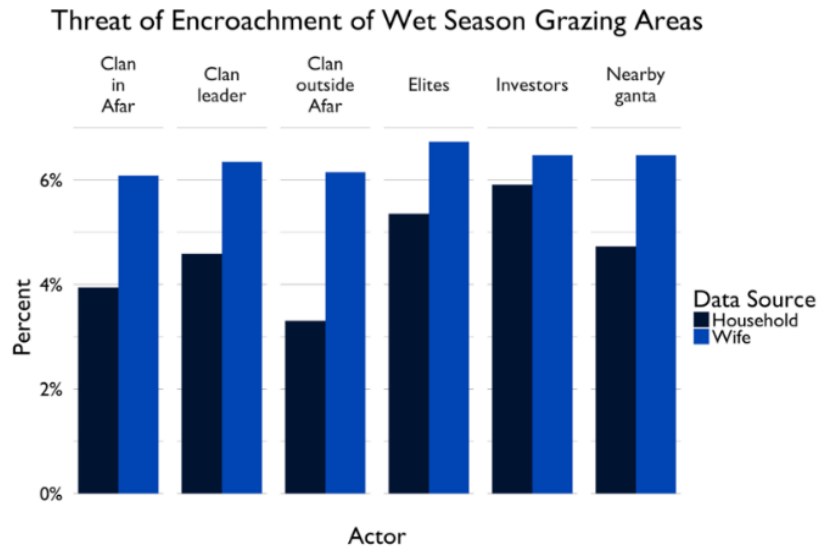
	<b>Boundaries are clear and respected</b>	<b>Government cannot take any part of the grazing area without negotiation and fair compensation</b>	<b>Investors cannot take any part of the grazing area land without negotiation and fair compensation</b>
<b>Household</b>			
Wet season grazing area	82% (1576)	70% (1430)	68% (1312)
Dry season grazing area	82% (929)	70% (794)	68% (769)
<b>Wives</b>			
Wet season grazing area	69% (1047)	70% (1052)	71% (1056)
Dry season grazing area	73% (205)	72% (200)	70% (195)
<b>Leader</b>			
Wet season grazing area	NA	NA	NA
Dry season grazing area	65% (171)	50% (132)	67% (177)

Households and wives were also asked a series of questions about the likelihood of a variety of actors encroaching on their wet or dry season grazing areas in the next one to three years, and farther into the future<sup>38</sup>. As Figures 4.1 and 4.2 illustrate, neither household head respondents nor wives respondents believe that any actor poses much threat of encroachment, but as was the case in the previous series of questions, investors are perceived to pose the greatest threat. It is interesting to note that across all actors, wives survey respondents are more likely to believe encroachment is ‘likely’ or ‘very likely’ than household survey respondents, but the overall number is too small to draw conclusions about gendered differences in perceptions of tenure security of their grazing area. Responses are similar when the questions were asked about the longer time horizon of four or more years into the future.

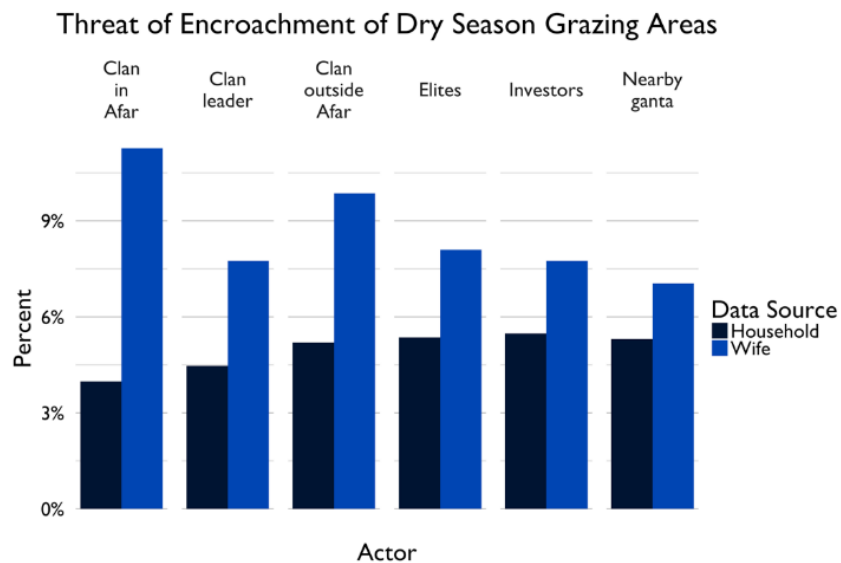
Greater tenure security in Amibara than Chifra is slightly counterintuitive, considering the high irrigation potential of farmland in Amibara due to its position alongside the Awash River Valley, as well as the large amounts of land government and private actors have already alienated. However, there are several possible explanations. First, Chifra is more of a frontier area than Amibara and borders the highlands of Amhara region, where there is heavy population of farmers who already have slowly moved down from highlands to cultivate lower altitude areas. Chifra residents might feel more pressure, fearing that neighboring farmers could begin to encroach on their lands and outside investors would look to the area as ‘frontier areas’ that they seek to invest. There also are concerns with water catchment management and protecting forests/catchments in west Chifra. Local residents, turn, might be concerned that the government might claim to protect forests and water catchments.

Second, it is possible that much of the desirable land along the Awash River in Amibara is already encroach on by prosopis that there is less land available for investment than in Chifra, was prosopis is less of a problem. With more and better quality land available for investment, Chifra residents may feel more vulnerable to land expropriation, and hence, tenure insecurity than those in Amibara.

<sup>38</sup> Time windows are framed around the LAND Afar project’s time line.

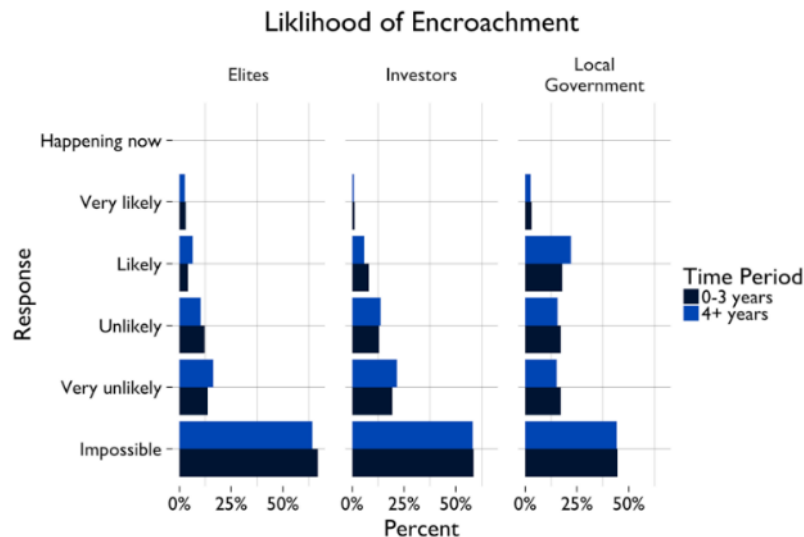


**FIGURE 4.1 ENCROACHMENT ON WET SEASON GRAZING AREAS IS 'LIKELY', 'VERY LIKELY', OR 'HAPPENING RIGHT NOW' IN THE NEXT 1-3 YEARS**

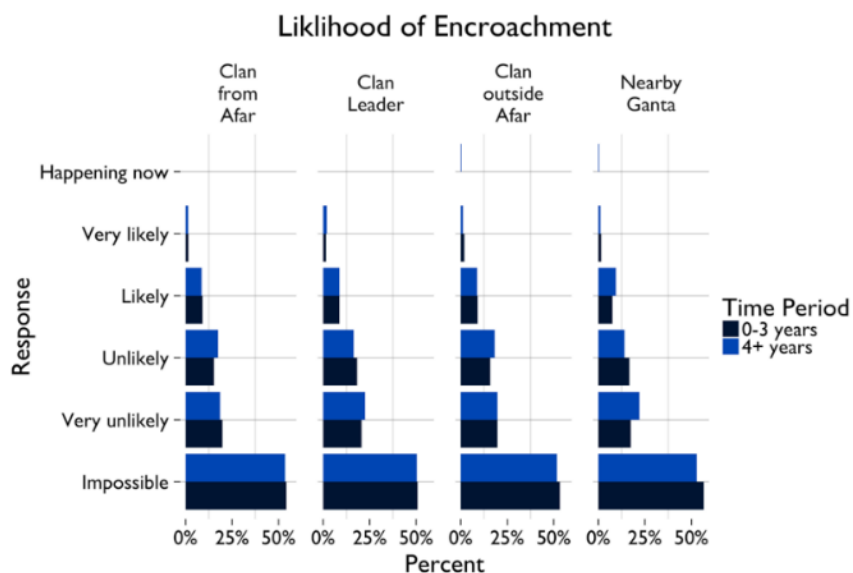


**FIGURE 4.2 ENCROACHMENT ON DRY SEASON GRAZING AREAS IS 'LIKELY' OR 'VERY LIKELY' 4 OR MORE YEARS INTO THE FUTURE**

Finally, it is possible that stronger customary leadership in Amibara than in Chifra makes households in Amibara feel less vulnerable to tenure insecurity than in Chifra. Overall, tenure insecurity is not a major problem in either Amibara or Chifra. This, coupled with data indicating strong customary leadership, suggests that residents feel that local leadership would not alienate their lands without fair compensation and negotiations.



**FIGURE 4.3 LIKELIHOOD OF ENCROACHMENT ON GRAZING LAND USED BY THE GANTA IN EITHER SEASON, AS REPORTED BY GANTA LEADERS**



**FIGURE 4.4 LIKELIHOOD OF ENCROACHMENT ON GRAZING LAND USED BY THE GANTA IN EITHER SEASON, AS REPORTED BY GANTA LEADERS**

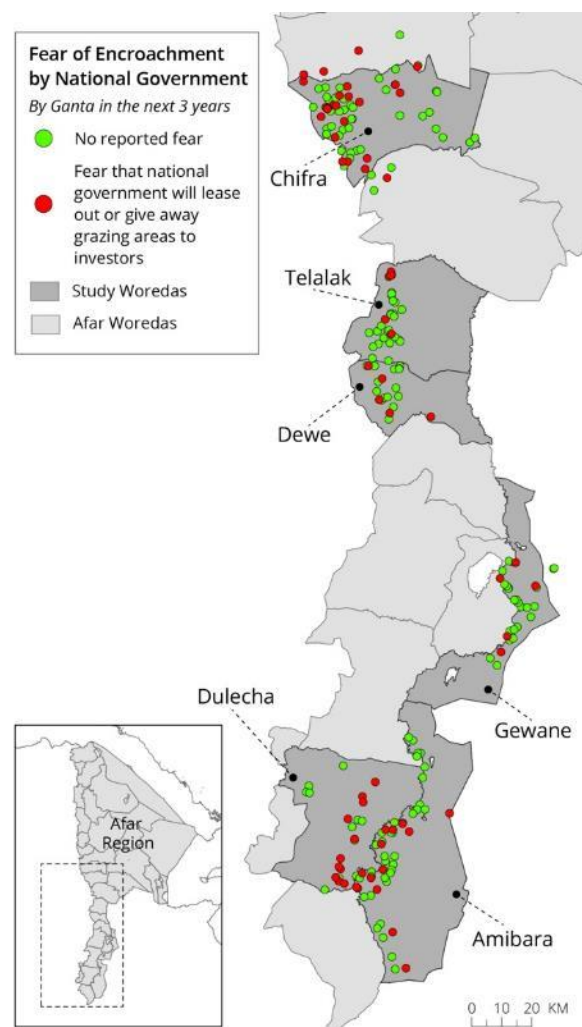
Ganta leaders were asked a similar series of questions about the likelihood of encroachment by the same actors on customary grazing land used by their ganta, both one to three years from now and four or more years into the future. Across all time periods and actors, the majority of ganta leaders report that it was ‘impossible’ for their customary land to be encroached upon. Ganta leaders believe the greatest threat to tenure security comes not from investors, as in the household survey, but from government. This is unsurprising, since the government usually mediates for private investors, allocates

land for parks and forest reserves, and other land allocation activities. Almost a quarter of leaders (21%, N=55) believe it likely that in the next three years the local government will lease out or give away land used by the ganta for investment purposes, and slightly more believe that the national government will do so (28%, N=73). In comparison, less than 10% of households believe encroachment by regional or national government is likely, either in the next three years or farther into the future. Figure 4.5 maps the location of gantas where leaders believe that it is likely that the national government will give away land used by their ganta for investment purposes. Despite an overall lower presence of investors, it appears that communities in Chifra and its controls are more concerned that their land will be given to investors by the government. The threat of encroachment by any actors on rangelands was rarely mentioned throughout KIs with customary leaders or FGDs.

However, the qualitative data suggest the perceived risk of encroachment on grazing areas by the government is driven not by lived experiences of government encroachment or reallocation, but rather the perceived power of the government to do so.

While few FGD participants report immediate and direct threats to customary grazing land as a result of the physical presence or specific actions of the government, expressions such as “Other individuals cannot take our land, but since the government has power, they can take land from us,” and “We do not suspect other people will take our grazing land but, we suspect the government may take it because they have the power,” from another group suggest that respondents in the study area lack confidence in their ability to protect their customary rights to land from the government. The sentiments complement the findings on governance in the study area (detailed in Section 5) indicating a perceived shift in the power and role of customary leaders over land use and rangeland management to formal government officials, such as kebele officials. For example, when asked about the changing influence of their clan leader in land use and rangeland management, women in Amibara explained, “His power is less now that the government law has been introduced.” Youth and Dewe said, “Before, we were saying the land is ours. Now the government comes and settles people without asking the residents. Now all land is under a rule.”

The qualitative data further suggest that the perceived risk of encroachment on grazing areas by investors may in fact be linked the perceived threat by the government and the lack of confidence in local their ability to protect their customary rights. For example, when customary leaders were asked who an investor would contact if they wanted to



**FIGURE 4.5 LOCATION OF GANTAS WHERE LEADERS BELIEVE ENCROACHMENT BY NATIONAL GOVERNMENT FOR INVESTMENT PURPOSES IS LIKELY**

obtain land, they more commonly answered formal government leaders would be approached rather than themselves. FGD respondents also commonly mentioned investors interested in land would approach the government through statements such as, “If an investor came to farm our land, they would ask the government. No one would give the government permission. All of the land belongs to the Ethiopian government and therefore they do not need any permission from others.”

## RESTRICTIONS IN GRAZING AREA ACCESS

Of the 263 ganta leaders, only eight (3%) reported that their gantas had lost access to any grazing areas, wet or dry season, in the past 12 months. In total, 12 grazing areas across the eight gantas were lost, and in all 12 instances of lost access, the entire ganta, not specific persons or groups, lost access to the grazing area.

The most common reasons for loss are investor activity (N=6), the development of infrastructure (N=4), and lack of water available at the area (N=3). Where restrictions were introduced, most of those restrictions were enacted by the *kedo* or *gulub abba* (N=8) or by the *fiema abba* (N=3). Customary leaders are most likely to impose restrictions due to lack of water (N=2) or infrastructure development (N=3). Restrictions that originate from regional or national government are exclusively due to investor activity (N=5).

Losing access to eight of the 12 grazing areas led to negative effects for members of the ganta, according to ganta leaders. The most common impact of the loss is households in the ganta had to graze their animals in another area, particularly forest area (N=6) or an area outside of the clan’s land (N=5). Other impacts, such as losing non-grazing resources (25%, N=2) or traditional ritual land (0%, N=0), were rare or nonexistent.

Households report losing access to grazing areas at an even lower rate than their leaders. Less than 1% of households report lost access to either wet (N=16) or dry (N=16) season grazing areas. Of this very small number of cases, half of the households (50%, N=8) report negative impacts from losing access to dry season grazing areas and only 31% (5) of these households have been negatively impacted by these restrictions to their wet season grazing areas. This discrepancy between the household and leader data suggests that either households are unaware of the new restrictions and perhaps not following the rules, or that ganta leaders may be exaggerating the extent of lost grazing land in an attempt to secure additional assistance from USAID or the Ethiopian government.

As detailed in Section 3, the main reason that participatory mapping exercise and FGD participants report having lost access to a grazing area is due to poor environmental conditions and subsequent changes in rangeland conditions, while increased restrictions were rarely mentioned. In one case, where the ganta still uses a grazing area despite poor conditions, a mapping participant divulges that they “use it [the grazing area] distantly.” In other words, “We got grass from Waale; no water is available there. One day we go to [the] water and another day we go to [the] grass, and we are in a problem [with] water.”

It is very rare for households to ask permission to access a grazing area in wet (4%, N=75,) or dry (3%, N=34) season areas. The ganta leader survey supports these findings, as 8% (N=16) ask permission to access a grazing area. When permission is required to be sought by the ganta leader, it is most often required from the *kedo abba* (81%, N=13), or clan leader.



Participatory mapping exercise participants know who “owns” the grazing areas that they use, even though they rarely have defined or demarcated borders, or are “protected” by the owner, which is understood in this context to mean that someone controls access to the water source. One respondent explains that maintaining open boundaries is an important calculus in a time of deteriorating environmental conditions: “If we forbid/protect them [other clans] from using pastureland, they will forbid us when there is a grass in their land, so we don’t forbid each other from using the land.” They describe a system where multiple clans use the same open grazing areas simultaneously, “We all use the land together. From this side the people from [redacted]... and from [the] other side those from [redacted] come together and use the land together... There are no administrators.”

As such, participants rarely indicate that their gantas seek permission to use grazing areas in Afar, but it is common practice to do so when using grazing areas in other regions, such as Amhara and Oromia. A participant explains, “We don’t need to ask permission since it is our land.” Similarly, another respondent during a different exercise describes the situation as follows: “Permission is needed when we go to [the] Amhara and Oromo areas. We don’t need permission in [the] Afar area.” Members of one ganta that travels to Amhara describe “buying” these permissions to use the grazing area, “It will have protection and we will buy from them.” In only one ganta was there indication that local permissions are a current practice, and interestingly, this is a new arrangement: “In the last time (past) no one was asked [to use pasture land], but now, he asks the chairman of the kebele. If they are non-Afar, there is committee, but if they are Afar, there are elders.”

## TENURE SECURITY—WATER POINTS

Households’ strong sense of tenure security also applies to their access to water points. As shown in Table 4.2, over 70% of households ‘agree’ or ‘strongly agree’ that their rights to access water points are clear and respected by local government, regional government, and investors. Similar to attitudes about tenure security of grazing areas, investors are seen as the greatest threat to water point access of the three actors, but the proportion of households who perceive this threat is small. The percentage of wives who believe their water point access rights are clear and respected is only slightly lower, hovering around 68% for all categories. Regional government is seen as the greatest threat to water point access by wives in both wet and dry season grazing areas. Water point security is perceived to be slightly higher in dry season grazing areas than in wet season grazing areas, perhaps because dry season lands are clearly understood clan lands and associated water points. Wet season points are more contingent and shared since water is much less of a constraint. Since wet season ones are of less value, they are not defended as a matter of survival in the way a dry season one would be<sup>39</sup>. Youth and female-headed households share similar perceptions as older or male-headed households.

---

<sup>39</sup> Personal correspondence with John McPeak

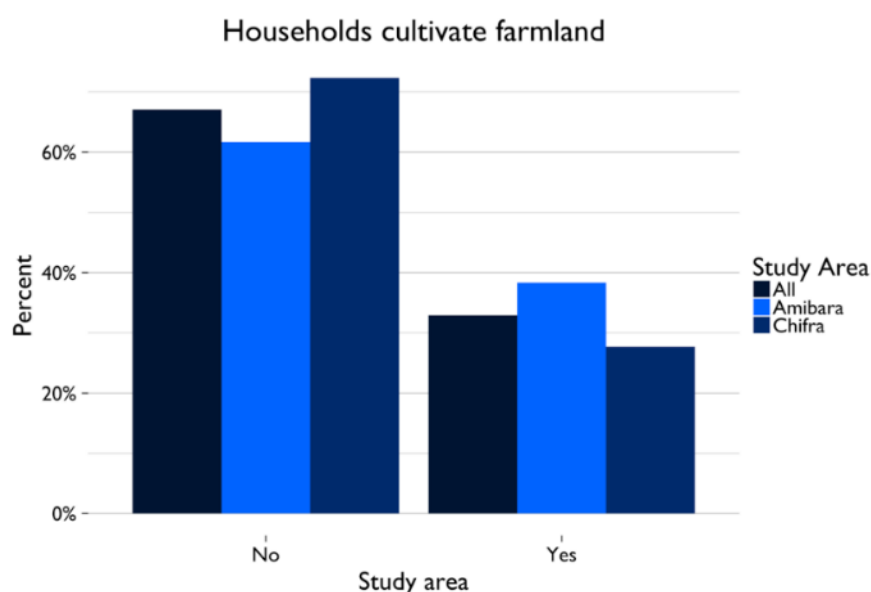
**TABLE 4.2 RESPONDENT'S PERCEPTIONS OF WATER POINT SECURITY**

	Right to access water points are clear and respected by local government	Right to access water points are clear and respected by regional government	Investors cannot take away any water points without negotiation and compensation
<b>Household</b>			
Wet season grazing area	77% (1479)	72% (1386)	68% (1305)
Dry season grazing area	81% (910)	75% (851)	68% (771)
<b>Wives</b>			
Wet season grazing area	70% (1048)	66% (995)	68% (1028)
Dry season grazing area	68% (1024)	64% (958)	67% (1016)
<b>Leader</b>			
Wet season grazing area	NA	NA	NA
Dry season grazing area	63% (166)	47% (124)	67% (175)

In comparison, ganta leaders report water point tenure as less secure than grazing area tenure, especially when considering national government actors. Just under half of all ganta leader respondents agree that the regional government respects their ganta's access rights to dry season water points (47%, N=118), and 63% of ganta leaders believe the local government respects their rights to dry season water points. It appears that the ganta leaders, as the primary interlocutors with the government, may be more aware of tenure security threats and issues than the general public. Unlike household heads and wives, ganta and clan leaders have seen their own power over water and land allocation erode as government presence has increased, and are therefore more likely to be attuned to this issue, and more likely to view it as a problem.

## AGRICULTURE AND TENURE SECURITY

The herding lifestyle predominates the study area, but a sizable minority of households engages in at least some agricultural cultivation activity, as shown in Figure 4.6. Thirty-three percent (982) of households cultivate or own farmland, and the percentage rises to 38% (572) in Amibara and its control woredas. Male-headed households (36%, N=794) are more likely to engage in agriculture than female-headed households (24%, N=188). As expected, wives are unlikely to be primarily responsible for any of their agricultural plots (5%, N=76). The mean size of farmland plots is 1.56 ha (SD=3.91 ha).

**FIGURE 4.6 AGRICULTURAL ACTIVITY BY STUDY AREA**

Plots are overwhelmingly used for cultivation (91%, N=987), as opposed to pasture for livestock (<1%, N=4), leaving the land fallow (7%, N=77), or renting or borrowing out the land (2%, N=17). Nearly three quarters of farmland plots are irrigated (74%, N=804). More than 99% of households with farmland have at least one irrigated plot (N=756), and these are overwhelmingly irrigated by a stream or river (97%, N=779). The overall perception of farmland fertility is moderate to low, as most plots are rated 'not very fertile' (46%, N=498) or 'average soil quality' (28%, N=326). Only a quarter of plots are thought to have above average fertility (25%, N=268).

There is no dominant way that households acquire their farmland. A quarter of plots were allocated from elders (25%, N=276), 28% (N=323) were allocated by the government, and another 19% (N=203) of plots were inherited. Households believe that the allocation of farmland was 'fair' or 'very fair' on 70% of fields (N=759), while approximately half of wives (52%, N=786) believe the process by which farmland is allocated is 'fair' or 'very fair'. The latter finding suggests that tenure rights of wives with regard to farmland are considerably less transparent than for men. Households were required to seek authorization to access the land in 38% of cases (N=418), typically from the clan leader (58%, N=242), the ganta leader (40%, N=164), woreda officials (42%, N=178), or a combination of the three. Sixteen percent (N=175) of households have some type of document for their farmland, such as a tax certificate.

A quarter of households (24%, N=729) expressed interest in acquiring additional farmland in the next year, and nearly three-quarters of those households (71%, N=518) believe acquiring additional land will require authorization. As was the case with authorization for land the household currently cultivates, the primary authorities for land allocation are the clan leader (54%, N=277), the ganta leader (37%, N=187), and woreda officials (45%, N=237).

When asked about how land is given to members of their ganta, women in Amibara detail the role of their *dantu* (described as "Afar parliament") and customary elders in land allocation, "They ask permission to get land from our male elders and the group we call *dantu*. The land is Afar and it is under the rule of the group of elders. It is divided among people according to their law."

Contrary to what is often found in other grazing areas, including in Ethiopia (USAID 2016), the growth of agriculture in the study area does not appear to come at the expense of household access to grazing land or water. Only 5% (N=143) of households report any areas used for grazing or water access being reallocated as farmland, and of those households, just 39% (N=55) report the reallocation affecting their household's grazing or water use patterns. Wives report reallocation at a similarly low percentage (7%, N=101), but only a third of these households believe that allocating land for farms has negatively impacted their households' access to grazing areas (32%, N=31). Wives also believe that the distance members of the household must travel to graze their livestock has increased (14%, N=227) due to farmland reallocation. Similar percentages of wives believe that their access to water points has been reduced (13%, N=208), and that the farmland reallocation process has made it more difficult for their household to water livestock (14%, N=211). These results are unexpected, since more than 90% of farmland is irrigable, and thereby located in the same riverine areas where livestock graze and water, particularly in the dry season. The lack of competition for water may be because there is river access provided in corridors between farms, however we would still expect to see competition for grazing between farmland and grazing lands, especially for households with large herds of livestock. In addition, the on-going drought and flood altered grazing patterns may mean that grazing areas in the past year were not near farming areas, making competition for water or land a non-issue.

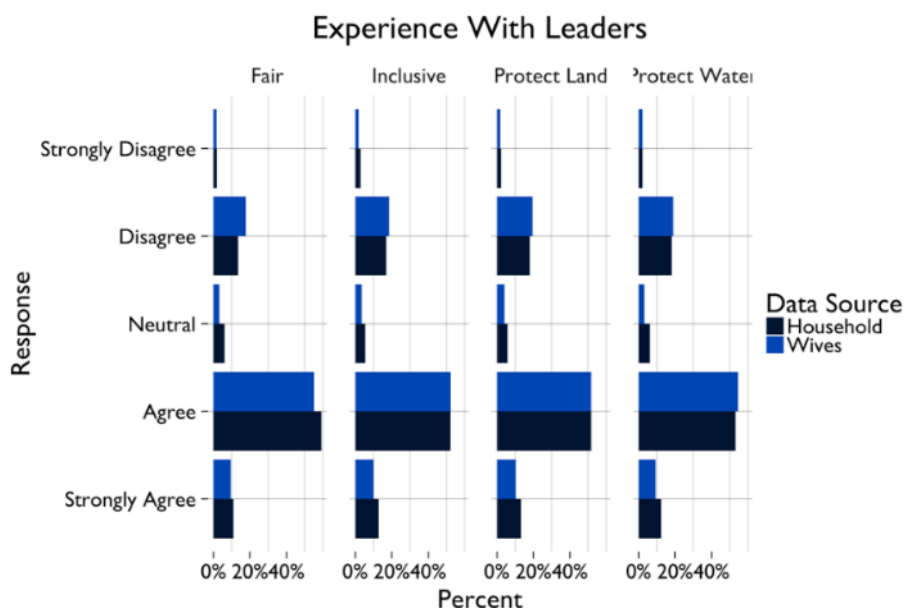
# 5.0 FINDINGS— GOVERNANCE

This section discusses key findings about roles and perceptions of customary leaders, land management rules, conflicts in the community, and the presence of investors. In general, households and wives are satisfied with how customary leaders protect their grazing lands and water, and believe their leaders act fairly and inclusively. They hold similarly positive perceptions of the fairness of the land allocation process, and of the fairness of ganta rules. Nearly half of gantas have at least one rule about land management, and rule topics include cutting of trees, opening and closing of pastures, and access to water points. When rules exist, they are frequently monitored and enforced, though less than a third of households believe that those who break the rules are punished. The likelihood of punishment is lower in the Chifra area than in the Amibara area. Conflicts are incredibly rare, impacting just 6% (N=193) of households. Conflicts about grazing area allocation are more common in the Chifra area than in the Amibara area, though administrative boundary disputes are the most common cause of conflict in both regions. Finally, investors have a growing presence in the study area, particularly in the Amibara area. Though investors do not universally engage with communities prior to beginning work in an area, two-thirds of respondents believe they have benefited from the presence of investors, including by receiving salaried jobs, opportunities for casual labor, and money transfers.

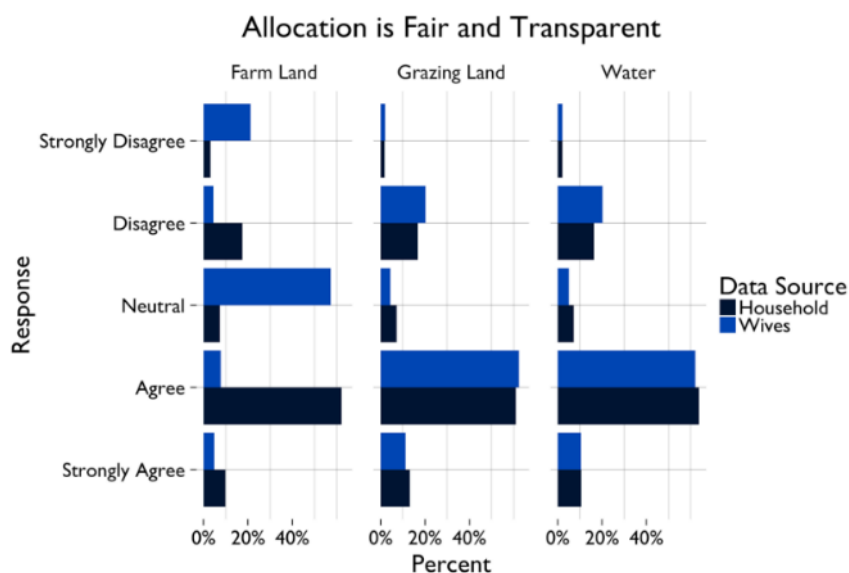
## **SATISFACTION WITH CUSTOMARY LEADERS**

Overall, households are satisfied with how customary leaders perform their grazing land management duties (67%, N=1998) and their water management duties (69%, N=2066). As illustrated in Figure 5.1, a notably lower percentage of wives (46%, N=698) report they are satisfied with the way customary leaders perform their tasks and duties related to grazing land management. A higher percentage of wives (55%, N=826) report they are satisfied with the way customary leaders perform their tasks and duties related to water management. As depicted in Figure 5.1, the majority of both household heads and wives believe that customary leaders are inclusive and transparent in their decision making, and that the decisions about customary land and water access are fair.

As detailed in Figure 5.2, over two-thirds of household heads ‘agree’ or ‘strongly agree’ that the decision-making process of customary leaders regarding grazing land (67%, N=2111) and water use (69%, N=2089) and access is fair and transparent. The process of allocating farmland, however, is perceived to be slightly less transparent (63%, N=1877), perhaps because allocating farmland is less common overall. Wives are less likely to agree that land allocation is fair and transparent across grazing land, water, and farmland, which may suggest that women are treated less favorably in decision making about resources and have greater constraints on gaining access to grazing land and water. This finding may also suggest that women have less information about land allocation processes, which may make decisions appear unfair.



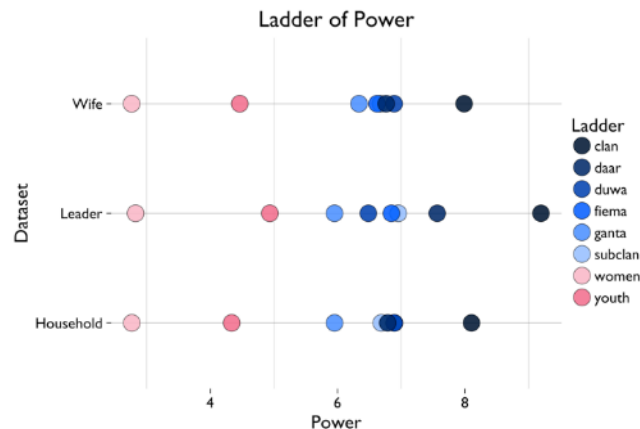
**FIGURE 5.1 RESPONDENT'S PERCEPTION OF LEADERS**



**FIGURE 5.2 RESPONDENT PERCEPTIONS OF ALLOCATION PROCESS**

All survey respondents were asked to rank customary leaders and various community sub-groups on a 'ladder of power' ranging from 1 to 10 for overall influence on decision-making regarding customary land use and management within the ganta, where the people at the top (10) of the ladder have the power to make lots of important decisions and the people at the bottom (1) of the ladder do not have any say. Figure 5.3 displays the findings across all three quantitative surveys, so that comparison can be made between the heads of household, wives and ganta leaders perceptions. The highest ranked official by households, wives, and leaders is the clan leader, or *kedo abba*. Unsurprisingly, the ganta leader, who is

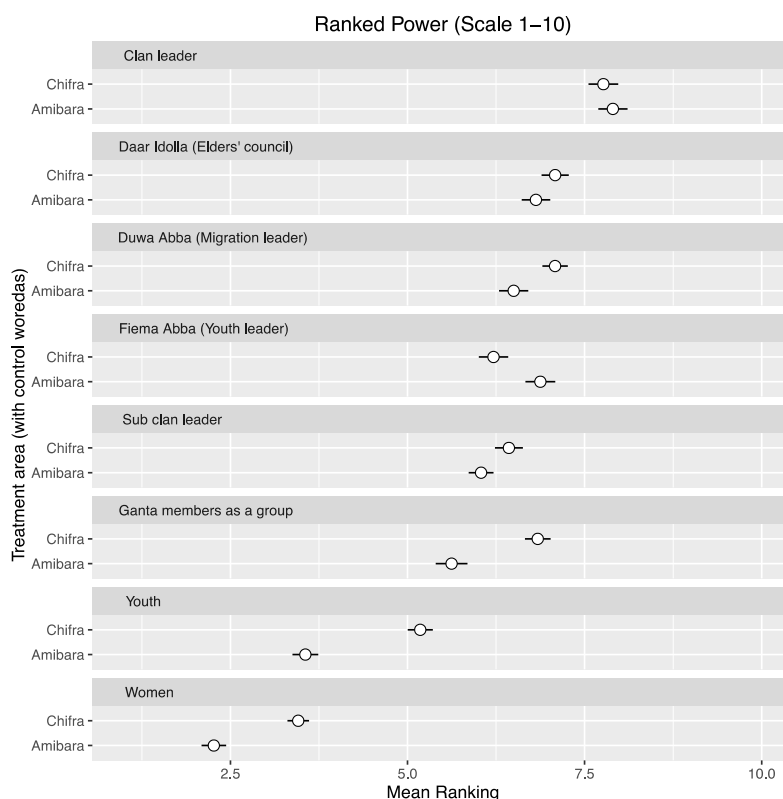
often also the clan leader, perceives his decision making power to be greater than households and wives perceive his power to be. The *daar-idolla*, or the elders' council is ranked as the second most important decision maker. All other customary leaders are closely clustered together. The sub-groups that were ranked the least important by all three types of survey respondents are women at the bottom, followed by youth, followed by the ganta as a whole.



**FIGURE 5.3 LADDER OF POWER**

Additionally, to understand relative power in decision making about water point

management in the grazing areas used by their ganta, wives were also asked to rank or 'line up' a series of actors from least to most power with respect to decisions related specifically to water point management. The wives' responses to this ladder of power series are broken down in Figure 5.4, disaggregated by the treatment region and its respective control woredas, so that differences in perception of actors in Chifra and its control woredas versus Amibara and its control woredas are visible.



**FIGURE 5.4 WATER POINT DECISION MAKING POWER**

In the wet season and the dry season grazing areas, respondents list the clan leader (WS: 6.9, sd=2.6) (DS: 8.0, sd=2.5) as the most important decision maker about water point management, followed by others in the clan's leadership such as members of the elders' council, or *daar-idolla* (WS: 7.0, sd=2.4) (DS: 6.8, sd=2.4), the migration leader, or *duwa abba* (WS: 6.9, sd=2.4) (DS: 6.9, sd=2.5), the youth leader and rule enforcer, or *fiema abba* (WS: 6.6, sd=2.5) (DS: 6.6, sd=2.5), and the Sub clan leader (6.7, sd=2.5) (6.7, sd=2.5). Ganta members together as a group are rated on the lower end of the spectrum on average (6.3, sd=2.6) (6.3, sd=2.5), but youth as a group (WS: 4.5, sd=2.3) (DS: 4.6, sd=2.3) and women as a group (WS: 2.8, sd=2.0) (DS: 2.9, sd=2.0) hold the least decision making power.

In both the wet season and dry season grazing areas, women as a group are assessed as slightly higher on this 'ladder of power' in Chifra (3.4 and 3.4) than in Amibara (2.1 and 2.2), but they remain the lowest group in relative position.

## MEETINGS

Nearly 20% (N=552) of household heads report at least one formal meeting was held in their ganta in the past year to discuss grazing land issues, including access, use, and conflicts. Comparatively, 13% (N=194) of wives report a similar meeting in their ganta in the past 12 months. In gantas where meetings took place, the majority held between one and five meetings, and the average number of meetings reported by households over the course of a year is 2.6 (sd=2.4).

When meetings do occur, they are not well-attended by households. Less than a quarter (24%, N=578) of households in gantas where meetings took place send one or more household members at least occasionally, and only 3% (N=77) of households always have a member attend. In 73% (N=235) of households that attend meetings, at least one person who attends from the household is female, though the percentage of wife survey respondents who report having attended a meeting is lower. Among wives in gantas where meetings took place, 38% (N=80) report attending at least one meeting.

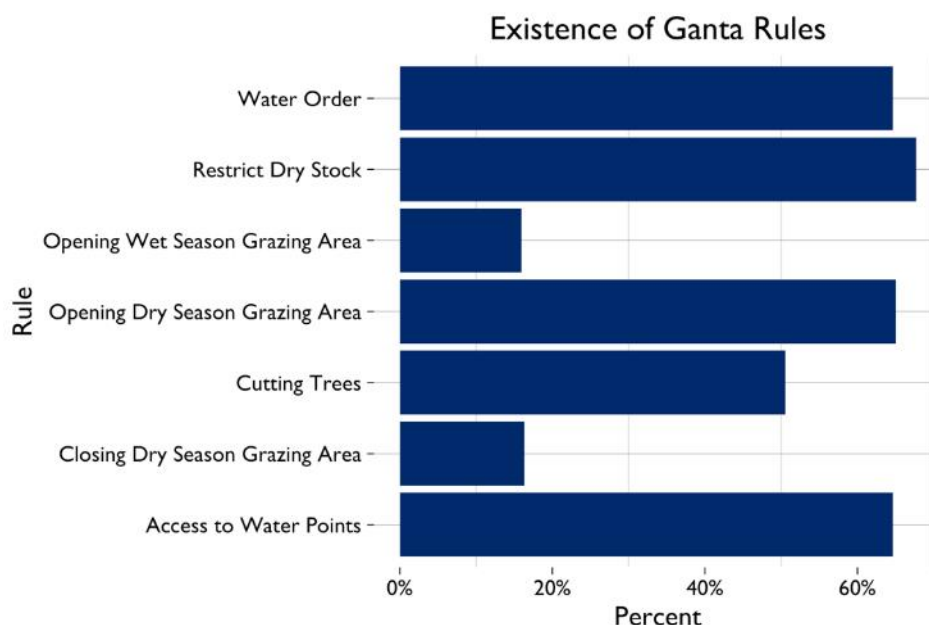
For those household heads who do not attend, the main reasons for their absence are not being invited (45%, N=856) and not knowing about the meeting (43%, N=828). Female-headed households are 14% more likely to never attend meetings (87%, N=551), than male-headed households (73%, N=1385). Similarly, when wives were asked why they did not attend any meetings to discuss issues related to grazing land and water resources, the most common reasons wives report are not being invited to meetings (39%, N=479) and not knowing about the meeting (27%, N=338).

Ganta leaders confirm household head and wife survey respondents' assessment that they were not invited to some meetings about land management. Leaders report that just under half the meetings held in the ganta were open to the entire community (46%, N=63), but the other half were limited to elders (54%, N=73), customary leaders (50%, N=67), and/or male adults (16%, N=22).



## RULES

Ganta leaders were asked a number of questions about rules that govern customary ganta and grazing land used by their community. Rules refer to both formal, written rules, and informal but generally understood rules. In general, rules are uncommon, though 44% (N=115) of gantas have at least one rule in place about land management. The most common rule type governs the cutting of trees, and exists in just over a third of gantas (35%, N=80). All other types of rules, including the opening and closing of pastures, access to water points, and rules about dry stock and the order of drawing water exist in approximately a fifth of villages. Figure 5.5 presents the presence of ganta rules in more detail.



**FIGURE 5.5 EXISTENCE OF RULES BY GANTA**

Customary officials, primarily the *kedo abba* and *fiema abba*, are overwhelmingly responsible for making and enforcing all types of land management rules. In all cases except tree cutting, the *kedo abba* is reported as the primary rule-maker by more than 60% of ganta leaders. The *kedo abba* is also identified as the primary rule enforcing body in every case. The *fiema abba* is the second most important actor for making and enforcing rules across all topics.

From the qualitative data, women in Amibara detail the process by which rules over the use of grazing areas are made by the Afar parliament: “This group [*dantu*] makes the rules, and upon hearing their call, many young people gather to meet with them. The youth can then exert their opinion.” When asked about rules over natural resource management and conservation, men in Amibara similarly note the role of the elders, youth, and community parliament: “We have rules, the rules are introduced by the elders in the area, youth leaders, and the community parliament.”

Government officials at the kebele, woreda, regional, or national level play a secondary, but still important, role. According to the results of the survey of ganta leaders, they are most involved in rules regulating or restricting the cutting of trees (45%, N=37), and least involved in rules about use of dry season grazing (or dry season reserve?) stock (7%, N=3). Kebele officials appear to be the most involved

of the government actors, though they are the primary rule maker or rule enforcer in less than 15% of gantas across any type of rule.

Government's rule making and enforcing role appears to be increasing, though customary leaders remain the most important. Qualitative findings highlight the increasing role and presence of formal government officials in land use and rangeland management. For example, women in Telalak describe the changing system of governance in their woredas: "Before we were traditionalists and ignorant of the government systems. Governance is newly arrived to our area". Also, when asked about changes in leadership, women in Telalak noted:

"We think those who rule in the past leadership was good. If you ask why? Because in the past Afar people were not introduced to the system of [formal] government, and they were using their livestock. Now, there is no one who helps poor people. There is no one who buys a cloth for the poor. When there was no government we were sharing our livestock. If you had no goat, somebody could give you. In the past our [traditional] leaders were looking after their people like orphans. But today's authority holders and leadership... do not care"

Women in Amibara also describe changes in the role of the government. When asked about the changing influence of their clan leader, women in Amibara explained, "His power is less now since the government law is introduced, since we are governed by his power... less. Because the educated mind and the uneducated mind is not the same." Similarly, a customary leader in Dewe also describes the increasing role of the formal government and says, "Nowadays most of Afar people do not decide without government."

The community as a whole rarely makes rules together, but community members do have a small part in enforcing them. Ganta members are most likely to be involved in rules about regulation or restriction of opening wet season pasture in grazing areas. Two gantas report that the entire ganta is responsible for making these rules (5%), and five gantas report the entire community is responsible for enforcing the rule (12%). Similar figures are true for rules about opening dry season pasture in grazing area—two gantas (4%) have the community make the rule, and four gantas (8%) rely on the community to enforce the rule.

In general, household heads are satisfied with the rules that govern their households' grazing land and water use, though a sizeable minority finds the rules unfair. Over two-thirds of household heads (N=2051) believe the rules that govern their households' grazing areas are 'fair' or 'very fair'. Rules about household water use are viewed even more favorably. Nearly three-quarters of household heads believe the rules that govern their household's water use are 'fair' or 'very fair' (74%, N=2213). The majority of wives (63%, N=952) also believe the rules governing the grazing land used by their household are fair, while a slightly higher percentage (70%, N=1045) believe the rules governing water used by their household are fair.

## **RULE ENFORCEMENT**

Ganta leaders report high levels of monitoring and enforcement for all rules. Ganta leaders report that offenders are caught and punished 'always' or 'most of the time' in at least 70% of communities with rules across all rule categories. Rules that regulate or restrict access to water points are most likely to be enforced (85%, N=33), and rules that regulate or restrict the opening of wet season pasture in

grazing areas are the least likely to be enforced (69%, N=29). Ganta leaders also report that members of the community have high levels of compliance with all land management rules, and ‘nearly everyone’ or ‘most members of the ganta’ follow the rules in at least 85% of communities across all rule types. The rules with the highest rate of compliance are about regulations or restrictions about opening dry season pasture in a grazing area (96%, N=46), and the rule with the lowest—but still very high—rate of compliance are rules about the restriction or regulation of wet season pastures (89%, N=34).

If a person is caught breaking rules about land management, 29% (N=886) of household heads believe that the rule breaker will be punished. This highlights a discrepancy between what the Ganta leaders would like others to think happens when a violation occurs—that 70% of violators are punished—and what is the perception from household heads—only 29% of violators are punished. One interpretation is that ganta leaders aim to show that they are fair in distributing justice evenly and voice what is the normative process (most violators are punished) and that there are not exceptions made based on political connections, status, etc. However, in reality, there may be exceptions made to individual violators, which is reflected in the responses of household heads<sup>40</sup>. By the nature of their position, ganta leaders are only aware of cases where rule violators are caught, were households may see people who violate the rules who are and are not apprehended.

For hypothetical cases of rule-breaking, customary leaders are most likely to punish the rule breaker in 55% (N=1670) of cases, most often the *daar-idolla* (34%, N=1004) or the *fiema abba* (18%, N=563). People caught breaking rules about water use, such as taking water out of turn, are punished at similarly low rates as people caught breaking rules about grazing land (30%, N=904), and are equally likely to be punished by customary leaders (56%, N=1698), primarily the *daar-idolla* (34%, N=1007) and the *fiema abba* (19%, N=586). This low rate of punishment suggests that creating stronger penalties for rule violation alone is unlikely to be a successful strategy for better land or water management.

Similar percentages are reflected in the wives data. Women in Amibara detail the process followed to punish those who violate rules over land use: “He who violates a traditional rule is punished by letting him offer cattle or goats which are slaughtered. There is a group called *dantu* and they are led by district elders. The punishment is exercised by the *dantu* and the advice is given by district elders.”

Female-headed households are less satisfied overall with land and water governance in their communities, which suggest these rules disadvantage this group. Female-headed households (60%, N=461) are 12% less likely to believe grazing land rules are fair than male-headed households (72%, N=1590) and 11% less likely to believe the customary leaders are doing a satisfactory job managing the grazing areas (FHH: 59%, N=463; 70%, N=1535). Additionally, female-headed households are 9% less likely to believe rules about water use are fair (FHH: 67%, N=523; MHH: 76%, N=1620), and 10% less likely to be satisfied with the performance of their customary leaders with regard to water (FHH: 62%, N=485; MHH: 72%, N=1579).

There are also significant differences among households in the perception of rules, where households in Chifra and its control woredas report less satisfaction with rules and their enforcement across the board, as shown in Table 5.1. Households in Chifra and its controls are 10% less likely than households in Amibara and its controls to believe rules regarding land management are fair, and also 10% less likely to view rules about water management as fair. Households in the Chifra area are also half as likely to report water rule breakers being punished, and 12% less likely to report land management rule breakers

---

40 Personal communication with Peter Little.

being punished. Finally, households in the Chifra area are also less likely to be satisfied with both land management rules and water management rules, and less likely to believe that the land and water management decision making process is fair and transparent.

**TABLE 5.1 SATISFACTION WITH RULES AND THEIR ENFORCEMENT**

	<b>Amibara and control woredas</b>	<b>Chifra and control woredas</b>
Rules regarding land management are fair	72%, N=1088	62%, N=963
Rules regarding water management are fair	79%, N=1188	69%, N=1025
Water rule breakers are punished	39%, N=579	21%, N=320
Land management rule breakers are punished	32%, N=522	23%, N=364
Satisfied with leaders' land management	73%, N=1084	61%, N=914
Satisfied with customary leaders' water management	75%, N=1132	63%, N=932
Land management decision making process is fair and transparent	75%, N=1120	60%, N=891
Water management decision making process is fair and transparent	75%, N=1147	61%, N=900

## CONFLICT

Only 6% (N=193) of household heads and 2% (N=32) of wives report experiencing any type of conflict over the past year. The most common type of conflicts wives report as experiencing are conflicts over access to a water point (N=12). The most common type of conflict households experience is by far conflicts over regional boundaries (3%, N=93), followed by conflicts over woreda or kebele boundaries (1%, N=31).

Just under half (48%, N=45) of the boundary conflicts and 31% (N=79) of all conflicts take place between members of different (non-Afar) ethnic groups. For example, qualitative data obtained from Chifra and Telalak provides evidence of conflict experienced with the Oromo—a non-Afar ethnic group—through quotes such as, “We and the Oromo fight over land, water, and grazing.” One participatory mapping respondent in Delucha details such a conflict with Oromo, “There are conflicts between Afar and Oromo’s where areas enough pasture are available... Oromo will not allow us to use pasturing land. Most of the time; they kill us, they cut-off the legs of our camel, they also beat our children and women, they steal our goats.... But we have no choice and we will stay with them.” Previous conflict with the Somali people was also mentioned frequently throughout qualitative data obtained from Amibara and Delucha.

An additional 12% (N=12) of regional boundary conflicts take place between households of the same clan. Seventy percent (N=65) of regional boundary disputes have resulted in violence, and 67% (N=62) have led to destruction of property or the loss of livestock. Figure 5.6 shows the total number of disputes about grazing areas by ganta, and suggests that disputes about grazing areas are more prevalent in Chifra and its controls than in Amibara and its controls.

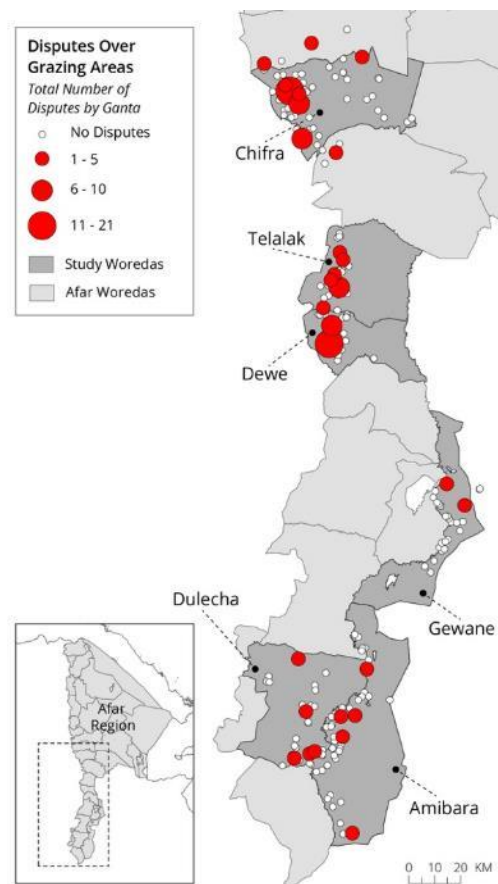
About three quarters of household heads that reported experiencing a regional boundary conflict (74%, N=69) report that the regional boundary conflict has been resolved. Sixty-two percent (N=44) of resolved regional boundary conflicts were resolved through government officials, usually multiple levels of officials, including PA, woreda, and officials outside of the PA and the woreda. Leaders of other ethnic groups resolved an additional 32% (N=23) of regional boundary conflicts. Nearly all households (85%, N=62) were satisfied with the resolution of their regional boundary conflict. These findings on the prevalence and resolution practices of boundary disputes align generally with findings from other pastoral areas of Ethiopia (USAID 2016).

Qualitative data show that methods of conflict resolution are very much dependent on the type of conflict, which is another finding consistent with previous work (USAID 2016). While minor and more local conflicts are commonly resolved by customary leaders, more serious conflicts between clans are solved by the government. An example illustrative of this theme is a quote from youth in Chifra who note: “If the conflict is external<sup>41</sup>, that conflict will be alleviated by regional government. If it is an internal conflict, we ourselves solve the problem.”

The qualitative data further suggest that—for internal conflicts—it is the primary responsibility of the *fiema abba* (youth leader) to resolve conflicts. One youth leader in Chifra notes, “I am a leader of the youth. When the youth cause a conflict, my task is my responsibility to find a solution for that, but if I can’t solve it, I transfer it to the clan leader and the clan leader and other elders solve it.”

Further evidence on the resolution of the conflict experienced in Amibara with the Somalis reveals the primary role of the formal government in the resolution of serious conflicts. Comments made throughout FGDs with groups in Amibara such as “There was a disagreement between us and the Somali people, now the government brought us peace,” and “The government made us reconcile with the Somalis saying ‘you are all Ethiopian nationals’” reveal the important role of the government in the resolution of this particular conflict.

Turning to the results of the ganta leaders survey, ganta leaders were asked about conflicts that the ganta has experienced with outside actors such as other gantas, other clans, other ethnic groups, government officials, and outside investors or companies. Just over a quarter of ganta leaders have themselves experienced a conflict between their ganta (29%, N=75) and one of these outside actors. Leaders are most likely to report one or more village level conflicts involving other gantas (18%, N=47), followed by other clans (15%, N=40) and other ethnic groups (11%, N=29). Conflicts between the ganta and government officials (3%, N=8) and the ganta and investors (3%, N=8) are both rare.



**FIGURE 5.6 TOTAL NUMBER OF DISPUTES ABOUT GRAZING AREAS BY GANTA**

<sup>41</sup> Internal conflicts are conflicts that occur within a ganta, and external conflicts take place with an actor outside the ganta.

The most common conflict topics reported by leaders are land allocation (16%, N=41), followed by boundaries (15%, N=40) and grazing livestock (14%, N=37). Disputes about water occur in 8% of gantas (N=21), and 6% of ganta leaders report at least one dispute about fencing (6%, N=15). The most common conflict types for all respondents are listed in Table 5.2.

**TABLE 5.2 PREVALENCE OF CONFLICT BY RESPONDENT<sup>42</sup>**

	Involved in any conflict	Most common conflict type	Second most common conflict type	Third most common conflict type
Household	6% (193)	Regional boundaries (3%, 93)	Woreda or kebele boundaries (1%, 31)	Loss of access to watering points (1%, 25)
Wife <sup>43</sup>	2% (32)	Access to a water point for personal consumption (1%, 12)	Fuel wood harvesting (1%, 9)	Access to a water point for livestock (<1%, 6)
Leader	26% (67)	Land allocation (16%, 41)	Boundaries (15%, 40)	Grazing livestock (14%, 37)

## INVESTORS

Sixteen percent (N=479) of household heads, 15% (N=229) of wives, and 10% (N=26) of ganta leaders report an investor presence in their kebele. Among respondents reporting the presence of an investor, the highest percentage report cotton farming (68%, N=331, of household heads; 75%, N=172, of wives; 77%, N=20, of ganta leaders) as the primary investor activity, followed by sugar farming (30%, N=135, of households; 30%, N=67, of wives; 35%, N=9, of ganta leaders). Investor presence is significantly more common in Amibara and its control sites. All ganta leaders who report an investor presence are located in Amibara, and only 6 households in Chifra believe an investor is present. The higher investor presence in Amibara is most likely influenced by that area's stronger road network and better infrastructure, as well as their better access to the Awash river for irrigation.

Despite no ganta leaders reporting an investor presence in their ganta, 11 households in Chifra report that they have lost access to grazing areas because of investors. No households in Amibara have had their access to grazing areas restricted. However, the overall N of these investor-related restrictions and reallocations is very small, which limits the scope of analysis that can be conducted. Unsurprisingly, households in Chifra are more likely to believe that investors could take grazing land and water points than households in Amibara. Seventy-one percent of ganta leaders in Amibara (N=90) are confident that investors cannot take grazing land, compared to 64% (N=87) of ganta leaders in Chifra. Similar percentages of ganta leaders are confident that investors cannot take water points<sup>44</sup>.

Figure 5.7<sup>45</sup> highlights kebeles where households report that investors are currently operating, as well as the location of gantas where community leaders report disputes with investors in the past 12 months.

<sup>42</sup> Households, wives, and leaders were all asked about the prevalence of different types of conflicts.

<sup>43</sup> Women seem not to be involved in many Afar governance institutions so it is not surprising that they do not claim boundaries as a common type of conflict.

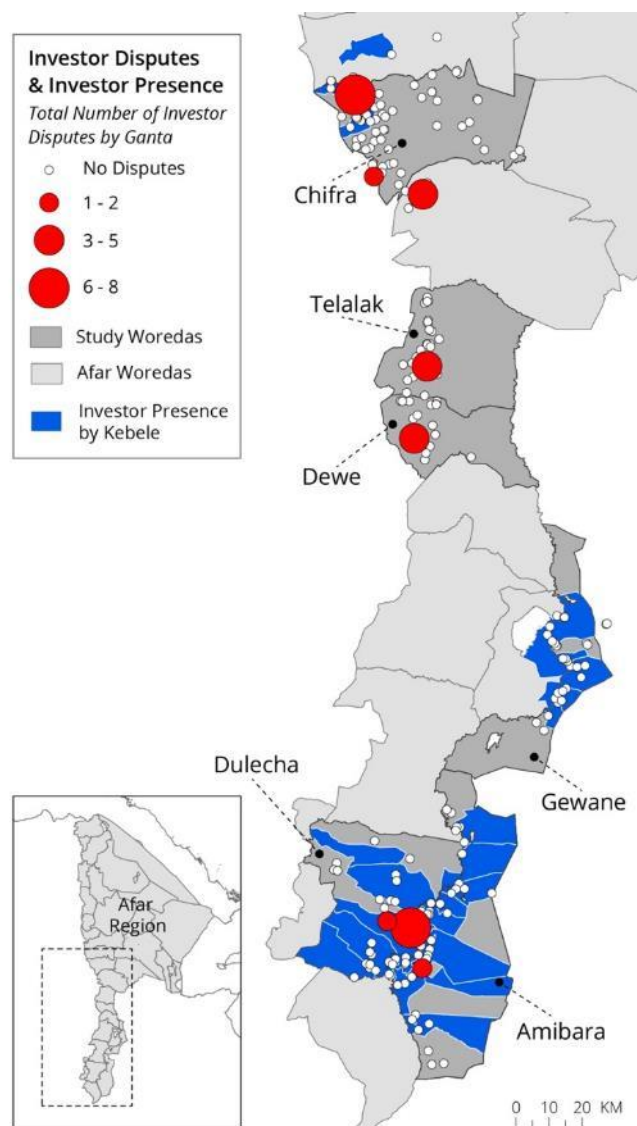
<sup>44</sup> 70% (N=88) of households in Amibara and 63% (N=87) of households in Chifra agree investors cannot take water points.

<sup>45</sup> There is not perfect alignment between reported presence of investor and reported investor conflict in this map for two possible reasons. One possible explanation is different time periods: the surveys ask about *current* investor presence vs investor disputes *within the past 12 months*. Another possible explanation could be inconsistency between the two survey data sources. One question is from the household survey—"Are there any investors/ companies operating in your kebele?"; while the other question is from the community leader survey—"In the past year, how many disagreements has your ganta experienced with outside investors or companies?"

While the presence of investors is higher in Amibara and its controls, Chifra and its control woredas report a higher level of conflict with investors, primarily about land allocation (N=7) and access to grazing areas (N=4) and water points (N=2). One explanation for this is very likely to be the longer timeframe of investor involvement and more established investor-community relations in Amibara than in Chifra where investor involvement has been more recent<sup>46</sup>. Another possible factor is that there is greater incidence of community benefits from investors in Amibara, which may compensate for any potential conflicts. The sample size of respondents in the Chifra area reporting an investor in this dataset is too small to be able to discern the role of investor benefits in reducing investor conflict. Another possible explanation is that households in Amibara are adopting agriculture to help accommodate land allocation for investments, reducing the number of conflicts over grazing areas. This question would benefit from additional research to better understand how these investor-community relations developed in Amibara over time and how these groups managed disputes.

Investors do not universally engage with communities before or during their presence in a community, but consultation and negotiations are not uncommon. A slight majority of household heads reporting that an outside investor was present in the ganta (56%, N=267), report that investors held meetings with their community, though these meetings were only held with the community as a whole in 18% (N=46) of cases, suggesting room for LAND to improve the consultation process. The remaining meetings were held with community leaders (46%, N=122) or clan leaders (34%, N=93). Almost half of households who live in communities where meetings were held with investors attended these meetings (48%, N=127). Unsurprisingly, the main reason households report not attending meetings is that they were not invited to attend (68%, N=95). Female-headed households (22%, N=17) are half as likely as male-headed households (58%, N=110) to attend meetings with investors.

Respondents to the wives survey report meetings with an outside investor occur at the same rate as respondents to the household survey, which suggests that women are not less aware of meetings than their husbands. Wives are, however, much less likely to actually attend the meeting. Just 14% (N=16)



**FIGURE 5.7 MAP OF INVESTOR PRESENCE**

<sup>46</sup> Personal communication with Peter Little



of wives report they attended a meeting, primarily because they believe they were not invited (63%, N=60).

Households in communities where there are outside investors are nearly equally divided about the transparency of the negotiation process with investors—just under half (49%, N=236) believe the process is ‘very transparent’ or ‘somewhat transparent’, while the others disagree (10%, N=49)<sup>47</sup>. Female-headed households and youth-headed households are equally likely to believe the process is transparent as their counterparts.

Transparent or not, investors are often perceived to have a positive impact on the communities where they work. Fifty-eight percent (N=276) of household heads reporting there was an outside investor in their ganta believe investors have changed their community for the better. Ganta leaders feel even more positively about the presence of investors. Although it is a very small sample of respondents, most ganta leaders (85%, N=22) in gantas where there is an outside investor report that conditions in their community have improved since the investor(s) entered the community, and no leaders believe conditions have gotten worse.

## POSITIVE IMPACTS

Two-thirds (66%, N=310) of household heads reporting the presence of outside investors think that investors have brought benefits to their community. Asked to identify the nature of the benefits, these household heads noted salaried jobs (64%, N=200) and casual labor (54%, N=169) were the leading benefits. Infrastructure investments in the host communities, such as improved roads, health clinics, or schools, are rare or nonexistent. Half (N=115) of wives reporting an investor or company operating in their ganta report that their ganta has received benefits from the investor, primarily jobs (78%, N=88) and money transfers from investors to community members (17%, N=21).

**TABLE 5.3 BENEFITS FROM INVESTORS**

Benefit	Household (N= 326)	Wives (N=115)	Leader (N=26)
Salaried jobs	64% (200)	77% (88) <sup>48</sup>	88% (23)
Casual labor	55% (169)	NA	NA
Health clinic	2% (8)	2% (2)	12% (3)
New secondary school	0% (0)	0% (0)	0% (0)
New/repared road	1% (2)	5% (6)	4% (1)
New/repared bridges	<1% (1)	0% (0)	4% (1)
Training	0% (0)	2% (2)	15% (4)
Money transfers	15% (49)	18% (21)	31% (8)
New water pump	4% (13)	2% (2)	NA
Electrification	2% (7)	4% (5)	0% (0)
Agricultural inputs	3% (10)	2% (2)	NA
Livestock inputs	12% (30)	13% (15)	NA

Again, ganta leaders in areas with outside investors paint an even more optimistic picture, and unanimously believe that investors have brought benefits to their community (100%, N=26), primarily salaried jobs (88%, N=23) and money transfers (31%, N=8). Based on field communications, it is not

47 The remaining respondents neither agree nor disagree (19%, N=93) or do not know (21%, N=101)

48 Casual labor was not included as an option in the wives survey. It is likely that casual labor has been included with salaried jobs.

unusual for community leaders to receive gifts, donations, and other gestures that are not shared with the community as a whole from investors seeking permission to work in an area, which may explain the additional enthusiasm by ganta leaders<sup>49</sup>.

## NEGATIVE IMPACTS

Only 11% of household heads identifying an outside investor in their area (N=52) believe that investor presence had negative impacts on their community, most commonly stated impacts are losing access to land for grazing (65%, N=34) and for farming (27%, N=14), and losing access to water for livestock (27%, N=14). A similar percentage of wives who noted the presence of an outside investor (13%, N=29) report their ganta has experienced negative effects as a result of investor activity in their ganta. The most common negative effects as a result of investor activity that wives report are losing access to land for grazing (93%, N=27) and losing access to water for livestock (24%, N=7). Only three ganta leaders report any negative impacts from investors, and in all three cases (100%) investors have caused gantas to lose land for agricultural purposes. As discussed in Section 4, investors are rarely seen as a threat to tenure security, and households, wives, and ganta leaders believe that the likelihood of investor encroachment on their grazing areas or ganta lands is very low.

**TABLE 5.4 NEGATIVE IMPACTS FROM INVESTORS WHEN AN OUTSIDE INVESTOR WAS NOTED AS PRESENT**

Negative impact	Household (N=52)	Wives (N=29)	Leader (N=3)
Lost land for grazing	65% (34)	93% (27)	0% (0)
Lost access to water for livestock	27% (14)	24% (7)	NA
Lost access to drinking water	11% (6)	10% (3)	NA
Lost land for farming	27% (14)	13% (4)	100% (3)
Lost sacred land	25% (13)	16% (5)	0% (0)
Lost houses	4% (2)	0% (0)	33% (1)
Lost building material	6% (3)	0% (0)	0% (0)
Fuel wood harder to collect	8% (4)	6% (2)	33% (1)
Medicinal plants destroyed	7% (4)	3% (1)	0% (0)
Water sources polluted	2% (1)	3% (1)	33% (1)

<sup>49</sup> Personal communication with BDS-CDR.

# 6.0 SUMMARY OF GENDER SPECIFIC FINDINGS

The LAND evaluation uses a wife-specific survey to learn about gendered differences among husbands and wives in relation to several key indicators in the study. The wives survey instrument asks a subset of the household survey questions, as well as new questions tailored to women's experiences, primarily focused on women's access to grazing land, perception of water point conditions, and perceptions of governance topics, such as ganta leaders, rules, and conflicts. Additional questions about inheritance and expenditures are unique to the wives survey. Gender differences and similarities across major outcomes of interest from the wives survey, household survey, and qualitative data are detailed in this section.

## GRAZING AREA ACCESS

Fifty-six percent (N=848) of all wives reported that they personally own at least one type of livestock. Among these wives, 46% (N=302) reported animals that they personally own migrated to wet season grazing areas in the past year. Among wives who reported animals they personally own migrated to wet season grazing areas in the past year, 86% (N=260) do some of the herding in wet season grazing areas themselves. The percentage of wives who own livestock that migrate to wet season areas and also herd their livestock is higher in Amibara and its control woredas, where 90% (N=87) of wives who own livestock that migrate to wet season areas reported herding their livestock, than in Chifra and its control woredas, where 84% (N=176) of wives do the same.

Roughly half of wives who own livestock indicate that they themselves or members of their ganta access grazing area (or areas) in the dry season that are different from wet season grazing areas (50%, N=284). Among these wives, 50% (N=142) affirm that animals that they personally own migrate to the different dry season grazing areas. Women in Chifra, Telalak, and Dewe (54%, N=185) are 9% more likely than women in Amibara, Gewane, and Delucha (45%, N=99) to move their animals to different dry season grazing areas.

The participatory mapping findings complement the findings from the wife survey that indicate that women often, but not always, travel to the wet and dry season grazing areas with their ganta. One respondent explains, "Yes [women migrate like men], you see all are migrated... a few number of women live in this village." In Chifra, one ganta leader indicated that the women do not migrate at all: "No, our females do not accompany [the] animals."<sup>50</sup>

---

50 With this finding about women (or even males) moving with animals, it is unclear if the wives are moving as part of the whole family, which would mean the family is essentially nomadic in the traditional sense, or if wives are herding at herd camps like males do. If the family is fully nomadic, children will move with their mothers (wives) but with distant herd camps children are going to stay at base household under the care of someone else. Less than 15% of families identify as nomadic, so if wives migrate a lot with animals then they must be going to herd camps, perhaps near households so wives can return in the evening.

## WATER ACCESS

Analysis of the qualitative data obtained from FGDs and participatory mapping exercises suggests that women across the study area are disparately impacted by the drought conditions, in part due to their responsibilities' related to collecting water. One participant explains that a major problem brought by the drought is the increasing distances women must travel to fetch water: "We are facing a lot of problems now. We lost our livestock because of drought. Women are carrying water longer and from far places that takes half day". In another group where women travel five hours to fetch water, they go "very distantly now" for water. A respondent expounds that this grueling work can lead to increased illness in women, "[Women] carry water and transport it on a long road... As a result, they are infected by a chest disease."

Furthermore, when asked to assess the condition of water points in grazing areas they travel to, the majority of wives stated that water point conditions are 'bad' or 'very bad' in regard to both wet season (69%, N=676) and dry season grazing areas (72%, N=708). The major reasons cited by wives for the poor condition of the water points in grazing areas are consistent across the wet season and dry season grazing areas and are detailed in Table 6.1.

**TABLE 6.1 REASONS FOR POOR RANGELAND CONDITION**

Reasons for poor rangeland condition	Wet Season	Dry Season
Lack of rain	94% (N=632)	92%, (N=664)
Erosion	48%, (N=324)	50% (N=364)
Encroachment of invasive bush species	38%, (N=254)	46% (N=331)

As stated previously, not only is a lack of rain leading to less water in terms of quantity, it is also leading to decreased amounts clean of water suitable for humans and livestock. The lack of rain at the time of the survey is due to the drought, and does not necessarily imply that rain has drastically decreased over time. Describing changes in the Awash river, a group of women in Amibara note:

"Earlier the river water was special, but now since chemicals are added to it, it produces a unique color. We have no option, we use it. However, there is a huge difference between the current and former river water...there are times when river water becomes not suitable for camels as well as cattle. Dirty water is not suitable for cattle, goats, camels or for human consumption. Both animals and humans don't drink such water."

While both men and women must adapt to deteriorating rangeland conditions and drought, FGDs conducted with women in the survey area help reveal the gender-specific effects of drought and deteriorating water sources on women. For example, women in Telalak detail the ways that women, as the group primarily responsible for providing water for their households, are disproportionately affected by having to fetch water from a pond that is far from their home: "Women are the producers of water. For this reason, they are mainly affected by the lack of water. Suppose they do not have enough time for work at home? And pregnant women are affected by the long walk on the road."

A group of men in Delucha explain the roles and responsibilities of women within the household mentioned above: "Among the Afar people, women are hard workers. Women fetch water from rivers and wells, women make the home in the Afar culture—women make food, women carry wood. Women do everything in Afar now."

The disproportionate effects of drought on women is also evident in Chifra, where a group of women explaining the effects of deteriorating water availability in grazing areas describe having to travel three hours to find water for their livestock. Elaborating on the difficulties encountered while traveling to find water for livestock they note: “When we walk after the animals, great problems face us. For example, women sometimes give birth in direct sunlight and are exposed to extensive heat. We go carrying the children on our backs. All of us, all pregnant women and old people too, so many problems face us.”

Another group of women in Chifra explain the problems they face while traveling to the river for water, and further suggest that not only drought, but livestock loss in the study area contribute to the challenges faced by women to obtain water.

“We walk from five to six hours to fetch water carrying jerry cans. This causes us kidney problems. We have to take our children with us... We have no donkey or camels, we are forced to walk and fetch water on our own. We only get tap water three or four months of the year.”

Women in Dewe detail increasing time commitments in regards to the water responsibilities of women due to the lack of rain and the resultant failure of a water tank they previously had access to:

“Five years ago we used to have a water tower but now we are facing problems because of no rain. When we had a water tower, we were waiting about three hours for water because of the high number of people who needed water, it was very difficult to get your turn. Now, if we leave home at nine o'clock in the morning we return home at five o'clock. If you leave later in the day, it's even worse. It is so difficult to travel a long distance carrying water. After we get home, we don't have enough food to eat and it's difficult to prepare food. When we had a water tower we did not face this many problems, though we still had to travel to find water for our cattle since they were prohibited from drinking from the water tower.”

While the role of women in water collection and the relative challenges faced by women in terms of access to clean water are widely evident in existing research from sub-Saharan Africa, the qualitative findings from the baseline study highlight the unique challenges faced by women in Afar, who in many cases must travel not only to collect water for household consumption, but also for the livestock that their livelihoods are dependent upon.

## **TENURE SECURITY**

While the percentage of wives who believe encroachment is likely in grazing areas remains relatively low (<8%) , wives consistently report a greater likelihood of encroachment on their wet and dry season grazing area lands than was found in the survey of household heads. Seventy percent of wife survey respondents ‘agree’ or ‘strongly agree’ that the boundaries of their grazing lands are clear and respected, and similar percentages agree that neither the government nor investors can take any part of their grazing land without negotiation and fair compensation.

When asked about the likelihood of the local government leasing out or giving away land dry season grazing areas used by their ganta for investment purposes, in the next 1-3 years 10% (N=145) wives reported they believe it was likely. The same percentages of wives (10%, N=149) report it was likely the national government will lease out or give away land used by their ganta for investment purposes in the next 1-3 years.

Further suggesting weaker perceptions of tenure security among wives in comparison to household survey respondents, the percentage of wives who believe their water point access rights are clear and respected by government authorities is slightly lower than household heads overall. More specifically, 70% (N=1048) of wives report their household's rights to access water points during the wet season are clear and respected by local government authorities, and 67% (995) report their household's rights to access water points during the wet season are clear and respected by regional government authorities. The findings are similar for dry season grazing areas, as 68% (989) of wives report their household's rights to access water points during the dry season are clear and respected by local government authorities, and 64% (958) report their household's rights to access water points during the dry season are clear and respected by regional government authorities. Compared to household survey respondents, wives are 4% more likely to believe that their water rights are clear and respected by local government in their wet season grazing area, but 2% less likely to believe this is true of their wet season grazing area. Wives are also less likely to believe the rights to access water points are clear and respected by regional government in both wet and dry season grazing areas, by 8% and 12% respectively.

Wives are also 11% more likely than household survey respondents to believe that the process of allocating land for farms in their PA that was previously used for grazing has negatively affected their households' access to grazing areas, as 14% (N=223) state that this is the case. Approximately the same percentage of wives (15%, N=227) report that the distance members of their household must travel to graze their livestock has increased as a result of land allocated for farms that was previously used for grazing. Similar percentages of wives also believe that their access to water points has reduced (13%, N=208), and that the farmland reallocation process has made it more difficult for their household to water livestock (14%, N=211).

## GOVERNANCE AND DECISION MAKING

According to wives surveyed, the participation of women in grazing land and water resource governance is uncommon, reported only by a quarter of wives interviewed across a number of topics. Over half (52%, N=806) of all wives report women in their ganta 'Never' participate in community decisions related to land management, while only one quarter (25%, N=379) of wives report women in their ganta 'Always' or 'Sometimes' participate. Similar percentages of women participate in community decisions about water management. Nearly half (49%, N=762) of all wives report women in their ganta 'Never' participate and 27% (N=410) of wives report women in their ganta 'Always' or 'Sometimes' participate. When asked about the participation of women in community decisions related to outsider use of grazing and water resources, 52% (N=804) of all wives report women in their ganta 'Never' participate, while approximately a quarter (26%, N=370) of wives report women in their ganta 'Always' or 'Sometimes' participate.

Qualitative evidence further suggests that the participation of women in rangeland and water management decisions varies throughout the study area. For example, women in Amibara detailing the process of decision making over the use of grazing areas state women in their ganta do not participate: "The elderly people sit and discuss about things, then they include the youth in the discussion, to avoid the possible risks. And the elders manage the process... Women have not been accepted as witnesses... we are weak in this sense."

On the other hand, when asked about the process of rangeland and water management decisions, women in Dewe note: "Final decisions are made with the involvement of the entire community. There is no decision made without the participation of women."

Wives survey respondents were also asked if their leaders consult the community in decision making regarding access to water points in grazing areas, and if so, whether or not women are included in consultations. In regards to wet season grazing areas accessed, wives survey respondents state that leaders consult the community about water point access in 47% (536, N=1054) of wet season grazing areas. In 69% (361, N=521) of wet season grazing areas where leaders consult the community, wives also report that women in the community are 'always', 'sometimes' or 'rarely' included in consultations. In most wet season grazing areas where women are involved in consultations, wives survey respondents state that women involved in consultations are mostly commonly selected by village leaders to participate (46%, N=167). In 32% (N=114) of wet season grazing areas where women are involved in consultations, wives reported that all interested women may participate and in 30%, of areas (N=108), wives reported the opinion of all women in the community is sought.

Similar to the findings on water point access in wet season grazing areas, wives reporting their ganta travels to separate dry season grazing areas also report their leaders consult the community about water point access in approximately 50% (N=409) of dry season grazing areas. In 64% (N=260) of dry season grazing areas where leaders consult the community, wives also report that women in the community are included in consultations. In most (45%, N=116) dry season grazing areas where women are involved in consultations, wives survey respondents state that all women who are interested are involved, followed by women who are selected by village leaders (40%, N=104) and all women in the community (29%, N=76).

## HOUSEHOLD DECISION MAKING REGARDING EXPENDITURES

When asked about their role in household decision making regarding expenditures over the past year, wives survey respondents were most likely to report that they made the majority of household decisions regarding expenditures on household goods (25%, N=375), food (21%, N=315), clothing (13%, N=202), health (10%, N=156), and education (9%, N=136). In terms of household decision making on expenditures related to livestock, 8% (N=120) of wives report that they made the majority of household decisions regarding expenditures on livestock management. A similar percentage (7%, N=108) of wives report that they made the majority of decisions regarding when and where to sell livestock products, and 9% (N=134) of wives reported making the majority of decisions over the past year regarding how to spend the funds earned from the sale of livestock products. Wives were least likely to report that they made the majority of household decisions regarding expenditures on farmland among the choices presented (5%, N=81).

## INHERITANCE

When asked about the rules in their ganta regarding land inheritance in the event of the death of a parent, 67% (N=1019) of all wives report that the rules for inheritance allow for a woman to inherit land, at least some of the time. In terms of livestock inheritance in the event of the death of a parent, 62% (N=967) wives report that the rules in their ganta allow a woman *with a brother* to inherit livestock. Wives are significantly more likely to report that the inheritance rules allow a woman *without a brother* to inherit livestock in the event of the death of a parent (87%, N=1315), suggesting that male children are favored in inheritance decisions and therefore more likely to inherit livestock from their parents than women.

When asked about the rules in their ganta regarding land inheritance in the event of the death of a husband, 40% (N=601) of all wives report that the rules allow a woman *without children* to inherit land



from her husband. In comparison, the wives survey data suggest a woman *with children* is more likely to inherit land from her husband in the event of his death, as 87% (N=1343) of wives report that the rules in their ganta allow for a woman to inherit land in this case. The majority of wives (70%, N=1049) further report that in the event of a husband's death, the husband's brother is the one who primarily decides what will happen to the household's land, while 12% (N=177) of wives report it is the clan elders who decide. In terms of livestock inheritance in the event of the death of a husband, 52% (N=786) of wives report that the rules allow a woman without children to inherit livestock. Similar to the findings on land inheritance, wives are more likely to report that the rules allow a woman with children to inherit livestock in the event of the death of a husband, as 88% (N=1365) of wives report the rules in their ganta allow for this.

When asked about the rules in their ganta regarding land inheritance in the event of divorce, 27% (N=416) of wives report that the rules allow a woman *without children* to take land in this case. A woman *with children* is more likely to be allowed to take land from her husband in the event of divorce, as 84% (N=1229) of wives report that the rules allow for a woman with children to take land in this case. In terms of livestock inheritance, 42% (N=654) of wives report that the rules allow a woman *without children* to take livestock in the event of divorce. Wives are more likely to report that the rules allow a woman *with children* to take livestock in the event of divorce, as 84% (N=1306) of wives report the rules in their ganta allow for this.

# 7.0 BALANCE & POWER

## METHODS FOR ASSESSING BALANCE

The LAND Afar IE uses the DD method to measure the treatment effect of the LAND project in Afar. The DD approach works well for situations where randomization of treatment is not possible, and can provide an accurate treatment estimate when treatment and control groups are dissimilar in some respects. To better isolate the treatment effect, and adjust for any balance issues, the evaluation will use a matching technique to pre-process the data for endline analysis. In particular, propensity score matching, genetic matching or entropy weighted matching will be used to improve balance between the treatment and control groups on key covariates. In addition, at endline, it will be important to check the balance on any exogenous factors that might have occurred between baseline and endline, including but not limited to other development interventions, civil unrest, or extreme weather events.

This report uses two approaches to gauge balance between the treatment and control groups on a variety of factors at baseline. The first is a linear model, using ganta level clustered standard errors, where variables are regressed against a dummy variable indicating LAND treatment. In short, this allows us to test whether or not treatment status alone "predicts" a difference between the treatment and control groups for a given outcome. With a well-balanced sample, we expect there to be no statistically significant differences between treatment and control groups at the time of the baseline survey. In other words, in this ideal scenario, we expect that treatment status is not a good predictor of outcomes that we hope to identify as changes between baseline and endline. The primary advantage of this hypothesis-based approach is that it enables the inclusion of controls or design variables (e.g., village or strata fixed effects), although some scholars also view it cautiously as a reliable means to assess balance, primarily because significance rests to some extent on the sample properties and size (Imai et al., 2008).

The second way we test balance is by taking the standardized difference in means for each variable, and reporting the standardized percent bias (Austin 2009). Under this approach, variables with an absolute percent bias < 25% are considered balanced (Stuart 2010). Typically, in this context, a statistically significant regression estimate, but a low % bias indicates a low response rate or very uniform response, where unique responses tend to be in one group. At the baseline, these two measures are sufficient to show that the control group can act as an accurate counterfactual to the treatment group for the endline analyses.

The first column of the balance tables lists the variables of interest. The Treatment column gives us the estimated effect of being in the treatment group on the variable of interest. The Constant column estimates the average value, regardless of treatment status. The Clustered S.E. (Standard Error) columns give the average difference between the observations, and the estimate, adjusting for within village correlations. Finally, the % Bias column gives the standardized difference in means between the two groups, as detailed above.

As specified in the evaluation design, balance and power statistics are first discussed for the entire sample. Then each treatment area (Chifra and Amibara) is compared separately to its respective control woredas, and the balance of each treatment area is assessed independently. In each of the following

sections, the first table contains control variables describing demographic and asset data, income sources, and respondent reported climate and development issues. The second table presents expected impact outcome variables at baseline, including governance, use of grazing area lands, and tenure security. These indicators are an illustrative sample of the full slate of indicators that will be used for the endline analysis. All variables are reported at either the respondent or household level. Most variables are either reported as binary responses<sup>51</sup>, or on a scale<sup>52</sup>.

## ENTIRE STUDY AREA

### DEMOGRAPHICS

The study sample is well balanced across all demographic indicators. Only seven indicators reveal statistically significant differences between treatment and control woredas, and none of these indicators have a level of bias above 25%. Households in Amibara and Chifra are 1.6 years older and 4% less likely to be ethnically Afar than households in Dewe, Delucha, Telalak, or Gewane. They are also 4% more likely to be male-headed, more likely to be able to read and write, and attain a higher level of education. Treatment households also own an average of three fewer goats or sheep than households in control areas, though they have equal herd sizes for larger animals.

**TABLE 7.1 HOUSEHOLD DEMOGRAPHICS INDICATORS—AGGREGATE**

	Treatment	Cluster S.E.	Constant	Cluster S.E.	N	% Bias
Head Ethnicity	-0.04***	0.01	0.99***	0	2986	22%
Head Sex	0.04***	0.01	1.24***	0.01	2926	9%
Head Age	1.61***	0.54	40.16***	0.37	2920	12%
Head Marital Status	0.01	0.02	2.36***	0.02	2920	2%
Head Ability to Read	0.06***	0.02	0.11	0.01	2911	17%
Head Ability to Write	0.05***	0.02	0.11	0.01	2911	16%
Perceived HH Ganta Status	0.1	0.09	4.05***	0.06	2987	6%
Highest Education in HH	2.5***	0.5	2.75	0.23	2987	23%
Large Livestock	0.07	0.5	5.83***	0.33	2987	1%
Small Livestock	-4.06***	1.11	21.87	0.84	2987	20%
Use of Wet Season Grazing Area	0.03	0.03	0.53***	0.02	2916	7%
Use of Dry Season Grazing Area	-0.01	0.03	0.44***	0.02	2906	3%
HH Cultivates/Owns Farmland	0.03	0.03	0.32***	0.02	2980	6%

### GRAZING

Grazing indicators for the entire sample are less well-balanced. Treatment households travel longer distances to both their wet and dry season grazing areas, and all but average distance to the wet season grazing area have a level of bias greater than 25%. Treatment and control households report similar changes in the area of their wet and dry season grazing areas.

51 0= "No", 1= "Yes"

52 On the scale, lower values are more "positive" responses (ex: Strongly agree, very good) and higher values are more "negative" (ex: Strongly disagree, very bad)

**TABLE 7.2 GRAZING AREA INDICATORS—AGGREGATE**

	Treatment	Cluster S.E.	Constant	Cluster S.E.	N	% Bias
Average Distance to WS (Hours)	3.22***	0.93	10.83	0.56	1575	23%
Average Condition of WS (Scale)	0.21***	0.04	2.54***	0.03	1567	34%
WS Area Change (Scale)	0.05	0.04	2.68***	0.03	1558	10%
Average Distance to DS (Hours)	12.8***	3.7	18.99	1.86	980	26%
Average Condition of DS (Scale)	0.18***	0.05	2.53***	0.04	978	33%
DS Area Change (Scale)	0.07	0.04	2.65***	0.04	970	14%

## GOVERNANCE

The sample is also well-balanced across governance indicators. Of the sixteen major indicators, only the number of investors operating in the kebele, an indicator with a very small number of instances, is significant with a bias above 25%. Treatment areas are 18% more likely to report the presence of investors. Other indicators that are statistically significant but have an acceptable level of bias include ganta meetings being held about grazing land, a belief that decisions about land and water are clear, and women's decision making power.

**TABLE 7.3 GOVERNANCE INDICATORS—AGGREGATE**

	Treatment	Cluster S.E.	Constant	Cluster S.E.	N	% Bias
Any Ganta Meetings About Grazing Land	0.04**	0.02	0.16	0.01	2987	12%
Land Rules Fair (Scale)	-0.05	0.03	2.02***	0.02	2291	7%
Water Rules Fair (Scale)	-0.04	0.04	2.05***	0.03	2512	5%
Satisfied With Customary Leader's Land Management	-0.1*	0.05	2.14***	0.04	2450	10%
Satisfied With Customary Leader's Water Management	-0.06	0.05	2.08***	0.04	2486	6%
Land Decision Making is Clear	-0.16***	0.05	2.41***	0.04	2710	17%
Water Decision Making is Clear	-0.17***	0.05	2.45***	0.04	2756	18%
Land ladder of power—Ganta Leader	-0.26*	0.16	6.15***	0.11	2772	11%
Land ladder of power—Subclan Leader	-0.06	0.17	6.79***	0.13	2771	2%
Land ladder of power—Fiema Abba	0	0.12	6.96***	0.08	2792	0%
Land ladder of power—Duwa Abba	-0.54	0.39	7.23***	0.38	2716	5%
Land ladder of power—Clan Leader	-0.26*	0.14	8.28***	0.08	2793	11%
Land ladder of power—Daar-Idolla	-0.36***	0.13	7.03***	0.08	2734	15%
Land ladder of power—Youth	-0.07	0.16	4.39***	0.12	2607	3%
Land ladder of power—Women	0.42***	0.13	2.53	0.09	2545	21%
Investors Operating in Kebele	0.18***	0.03	0.07	0.02	2959	50%

## GOVERNANCE

Treatment and control woredas are particularly well-balanced across governance indicators. Just two of the 23 indicators tested for balance have statistically significant differences in addition to a level of bias above 25%. Households in treatment woredas are .19 points less likely to believe their rights to access water points in their wet season grazing areas are respected than households in control woredas, significant at the 1% level with a 25% level of bias. Treatment woredas are .18 points more likely to believe elites may encroach on their dry season grazing area, significant at the 1% level with a 28% level of bias. Treatment and control households are equally likely report restrictions in their wet and dry grazing area, and to believe their wet and dry season grazing areas will be encroached by investors, ganta leaders, or clans within or outside of Afar.

**TABLE 7.4 TENURE SECURITY INDICATORS—AGGREGATE**

	Treatment	Cluster S.E.	Constant	Cluster S.E.	N	% Bias
WS Graze Restrictions	-0.01	0.01	0.01***	0.01	1570	6%
WS Elite Encroachment (Scale)	-0.05**	0.02	2.91***	0.02	1536	12%
WS Investor Encroachment (Scale)	-0.04	0.03	2.91***	0.02	1536	10%
WS Ganta Leader Encroachment (Scale)	-0.02	0.02	2.91***	0.02	1543	4%
WS Clan Leader Encroachment (Scale)	-0.01	0.02	2.91***	0.02	1539	3%
WS Afar Clan Encroachment (Scale)	0	0.02	2.92***	0.02	1544	1%
WS Outside Clan Encroachment (Scale)	-0.01	0.02	2.93***	0.01	1542	2%
WS Right to Access Water Points Respected (Scale)	-0.19***	0.05	1.47	0.04	1528	25%
WS Grazing Boundaries Clear (Scale)	-0.16***	0.05	1.39	0.04	1550	23%
WS Safe From Government (Scale)	-0.1*	0.05	1.53	0.04	1532	12%
WS Safe From Investors (Scale)	-0.07	0.06	1.57***	0.04	1530	8%
DS Graze Restrictions	-0.02*	0.01	0.02***	0.01	981	12%
DS Elite Encroachment (Scale)	0.18***	0.06	2.95***	0.04	930	28%
DS Investor Encroachment (Scale)	0.05	0.04	2.84***	0.03	937	11%
DS Ganta Leader Encroachment (Scale)	0.09**	0.04	2.83***	0.03	941	19%
DS Clan Leader Encroachment (Scale)	0.06*	0.03	2.86***	0.03	942	15%
DS Afar Clan Encroachment (Scale)	0.06*	0.03	2.88***	0.03	938	16%
DS Outside Clan Encroachment (Scale)	0.06*	0.04	2.85***	0.03	942	14%
DS Right to Access Water Points Respected (Scale)	-0.14**	0.06	1.4	0.05	950	20%
DS Grazing Boundaries Clear (Scale)	-0.12**	0.06	1.37	0.04	960	17%
DS Safe From Government (Scale)	-0.18**	0.07	1.6	0.05	937	22%
DS Safe From Investors (Scale)	-0.12	0.08	1.62***	0.05	938	13%
Likelihood of Local Government Encroachment on Ganta (Scale)	-0.07	0.04	4.72***	0.03	2787	8%

## AMIBARA

### DEMOGRAPHICS

Household are generally balanced on demographic characteristics. There are some balance issues with significant treatment indicators, but the bias for most indicators is below 25%. The main exception is the level of education achieved in the household and the number of small livestock owned. Households in Amibara also own 5 fewer small livestock (goats and sheep) than households in the control area, significant at the 1% level and a 25% level of bias. Households in Amibara also attain more than three additional years of education than households in Gewane and Delucha, significant at the 1% level and with a bias of 30%. Related to education levels, household heads in Amibara are also 6% more likely to be able to read and write, significant at the 1% level and a 22% level of bias. Households in Amibara are also 4% less likely to be ethnically Afar, significant at the 5% level. Household heads in Amibara are nearly three years older (significant at the 1% level), and almost 10% less likely to use a wet or dry season grazing area (significant at the 5% level) than control households, though the level of bias for both indicators is below 25%, suggesting these differences are not large enough to be concerned about.

**TABLE 7.5 HOUSEHOLD DEMOGRAPHICS INDICATORS—AMIBARA**

	Treatment	Cluster S.E.	Constant	Cluster S.E.	N	% Bias
Head Ethnicity	-0.04**	0.02	0.99***	0	1494	24%
Head Sex	0.04***	0.02	1.22***	0.01	1472	10%
Head Age	2.86***	0.74	40.41***	0.51	1467	21%
Head Marital Status	0.01	0.04	2.36***	0.03	1468	1%
Head Ability to Read	0.06**	0.02	0.08	0.01	1469	20%
Head Ability to Write	0.06**	0.02	0.08	0.01	1469	20%
Perceived HH Ganta Status	-0.15	0.13	3.83***	0.08	1495	9%
Highest Education in HH	3.11***	0.77	1.97	0.27	1495	30%
Large Livestock	1.2	0.85	6.54***	0.43	1495	11%
Small Livestock	-5.24***	1.55	24.81	1.15	1495	25%
Use of Wet Season Grazing Area	-0.09**	0.04	0.56	0.02	1477	17%
Use of Dry Season Grazing Area	-0.1***	0.04	0.35	0.03	1467	22%
HH Cultivates/Owns Farmland	0.09*	0.05	0.34	0.03	1494	19%

### GRAZING

There do appear to be important differences in the condition of grazing areas between Amibara and its control woredas. Of the six grazing area indicators examined, two are statistically significant at the 1% level, and three have a level of bias greater than 25%. Households in Amibara travel more hours to reach their wet season and dry season grazing area than control households, and are more likely to rank their wet and dry season grazing lands unfavorably, perhaps due to the invasion of prosopis in Amibara. They are equally likely to believe that the condition of their grazing areas have gotten worse.

**TABLE 7.6 GRAZING AREA INDICATORS—AMIBARA**

	<b>Treatment</b>	<b>Cluster S.E.</b>	<b>Constant</b>	<b>Cluster S.E.</b>	<b>N</b>	<b>% Bias</b>
Average Distance to WS (Hours)	8.14***	1.59	8.55	0.63	758	54%
Average Condition of WS (Scale)	0.15**	0.06	2.57	0.05	756	24%
WS Area Change (Scale)	-0.03	0.05	2.74***	0.03	754	5%
Average Distance to DS (Hours)	26.77***	7.25	12.48	2.08	315	50%
Average Condition of DS (Scale)	0.16**	0.08	2.59	0.06	313	29%
DS Area Change (Scale)	-0.1	0.07	2.78***	0.04	313	19%

## GOVERNANCE

Households in Amibara and in control areas are generally well-balanced across likely governance indicators. Households are equally likely to believe that rules about land and water are fair and that the decision-making process is clear, as well as to be satisfied with customary leader's management of land and water. Households in Amibara are slightly more likely to believe that decisions about water are clear, significant at the 10% level with a 13% level of bias.

The variables that do indicate a difference large enough to cause concern are again related to the comparative urbanization of Amibara compared to treatment areas. Investors are 46% more likely to operate in Amibara, significant at the 1% level and with a bias of 110%, however this difference is likely exaggerated because of the rarity of investment activity overall. Households in Amibara are also 12% more likely to report any ganta meetings taking place about grazing land management in the past year, with a bias of 29%. It is in instances of imbalance such as these that it will be important to pre-process the data prior to endline analysis with a matching technique that reweights the control data points so that they more closely resemble the treatment observations.

Less concerning are differences in the ladder of power questions about land decision making. Households in Amibara consistently ranked every customary leader lower on a 10-point scale than did households in control woredas. The difference is significant at the 1% level, and the bias ranges between 0%-46%. This may be related to the greater presence of the government and administration officials in Amibara, which diminishes the roles of customary leaders. Going forward, we will need to pay attention to this imbalance, but there is still clearly overlap and similarities in the treatment and control woredas.



**TABLE 7.7 GOVERNANCE INDICATORS—AMIBARA**

	<b>Treatment</b>	<b>Cluster S.E.</b>	<b>Constant</b>	<b>Cluster S.E.</b>	<b>N</b>	<b>% Bias</b>
Any Ganta Meetings About Grazing Land	0.12***	0.03	0.15	0.02	1495	29%
Land Rules Fair (Scale)	0.06	0.05	2.02***	0.03	1253	9%
Water Rules Fair (Scale)	0.03	0.05	2.04***	0.04	1368	5%
Satisfied With Customary Leader's Land Management	-0.04	0.08	2.13***	0.06	1342	4%
Satisfied With Customary Leader's Water Management	0	0.08	2.05***	0.05	1369	0%
Land Decision Making is Clear	-0.07	0.06	2.21***	0.04	1397	8%
Water Decision Making is Clear	-0.1	0.06	2.26***	0.04	1431	12%
Land ladder of power—Ganta Leader	-0.97***	0.21	5.96	0.14	1339	40%
Land ladder of power—Subclan Leader	-0.79***	0.23	6.81	0.19	1435	24%
Land ladder of power—Fiema Abba	-0.76***	0.15	7.41***	0.07	1430	33%
Land ladder of power—Duwa Abba	-1.73***	0.66	7.73	0.64	1367	13%
Land ladder of power—Clan Leader	-0.87***	0.21	8.38***	0.1	1445	37%
Land ladder of power—Daar-Idolla	-0.95***	0.17	7.19***	0.09	1391	39%
Land ladder of power—Youth	-0.9***	0.22	4.15	0.17	1208	46%
Land ladder of power—Women	-0.01	0.15	2.12***	0.13	1154	0%
Investors Operating in Kebele	0.46***	0.05	0.12	0.02	1483	110%

### TENURE SECURITY

Households are well-balanced across a number of tenure security indicators, including threat of encroachment of wet season grazing areas across a variety of actors, access rights to water points are respected in both wet and dry season grazing areas, and the likelihood of encroachment on wet and dry season grazing land. Households in Amibara are slightly more likely to believe their land is secure from elite encroachment, significant at the 1% level and a 24% level of bias.

**TABLE 7.8 TENURE SECURITY INDICATORS—AMIBARA**

	Treatment	Cluster S.E.	Constant	Cluster S.E.	N	% Bias
WS Graze Restrictions	0	0.01	0.01**	0	757	1%
WS Elite Encroachment (Scale)	-0.13***	0.05	2.88***	0.02	743	24%
WS Investor Encroachment (Scale)	-0.1*	0.05	2.88***	0.03	741	19%
WS Ganta Leader Encroachment (Scale)	-0.08*	0.05	2.89***	0.02	751	16%
WS Clan Leader Encroachment (Scale)	-0.04	0.04	2.88***	0.02	747	8%
WS Afar Clan Encroachment (Scale)	-0.05	0.04	2.89***	0.02	747	10%
WS Outside Clan Encroachment (Scale)	-0.06	0.04	2.91***	0.02	746	13%
WS Right to Access Water Points Respected (Scale)	-0.08	0.07	1.38***	0.05	740	11%
WS Grazing Boundaries Clear (Scale)	-0.09	0.06	1.33***	0.05	753	14%
WS Safe From Government (Scale)	-0.06	0.07	1.4***	0.05	751	7%
WS Safe From Investors (Scale)	-0.06	0.08	1.46***	0.05	752	7%
DS Graze Restrictions	-0.01	0.01	0.01	0.01	314	14%
DS Elite Encroachment (Scale)	0.06	0.1	2.81***	0.06	309	8%
DS Investor Encroachment (Scale)	0.01	0.09	2.8***	0.06	311	1%
DS Ganta Leader Encroachment (Scale)	0.05	0.08	2.81***	0.06	310	10%
DS Clan Leader Encroachment (Scale)	0.05	0.08	2.81***	0.05	311	9%
DS Afar Clan Encroachment (Scale)	0.05	0.09	2.81***	0.06	310	9%
DS Outside Clan Encroachment (Scale)	0.03	0.09	2.8***	0.06	310	6%
DS Right to Access Water Points Respected (Scale)	-0.11	0.12	1.43***	0.09	312	14%
DS Grazing Boundaries Clear (Scale)	-0.12	0.12	1.41***	0.08	314	16%
DS Safe From Government (Scale)	0	0.14	1.51***	0.09	310	0%
DS Safe From Investors (Scale)	0	0.14	1.56***	0.09	311	0%
Likelihood of Local Government Encroachment on Ganta (Scale)	-0.06	0.06	4.56***	0.04	1413	6%

**CHIFRA****DEMOGRAPHICS**

Households in Chifra and its control woredas, Telalak and Dewe, look similar to each other across demographics. There are no significant differences in livestock owned, cultivation of farmland, perceived socioeconomic status, ethnicity, sex of the household head, or ability to read or write. Chifra households are significantly more likely—at the 1% level—to access a wet season grazing area, with a level of bias of 29%. In addition, households in Chifra have 1.5 more years of education and are 4% less likely to be ethnically Afar, though neither of these indicators have a level of bias above the 25% threshold.

**TABLE 7.9 HOUSEHOLD DEMOGRAPHICS INDICATORS—CHIFRA**

	<b>Treatment</b>	<b>Cluster S.E.</b>	<b>Constant</b>	<b>Cluster S.E.</b>	<b>N</b>	<b>% Bias</b>
Head Ethnicity	-0.04*	0.02	0.98***	0.01	1492	19%
Head Sex	0.03**	0.01	1.26***	0.01	1454	6%
Head Age	0.86	0.74	39.81***	0.52	1453	6%
Head Marital Status	0.02	0.03	2.36***	0.02	1452	2%
Head Ability to Read	0.04	0.02	0.15***	0.02	1442	10%
Head Ability to Write	0.03	0.02	0.15***	0.02	1442	8%
Perceived HH Ganta Status	0.14	0.09	4.36***	0.07	1492	9%
Highest Education in HH	1.54**	0.66	3.83	0.37	1492	13%
Large Livestock	-0.29	0.57	4.84***	0.48	1492	4%
Small Livestock	-1.25	1.42	17.79***	1.01	1492	7%
Use of Wet Season Grazing Area	0.14***	0.04	0.49	0.03	1439	29%
Use of Dry Season Grazing Area	-0.01	0.04	0.57***	0.03	1439	3%
HH Cultivates/Owns Farmland	-0.01	0.04	0.28***	0.02	1486	1%

## GOVERNANCE

Governance indicators are well balanced between Chifra and its controls. Five out of sixteen indicators that were tested for balance are statistically significant at the 1% level, but none have a bias above 25%. While control and treatment households report ganta meetings taking place at similar frequency and appear equally satisfied with customary leader's land and water management, treatment households are 10% less likely to believe that land decision making is clear, significant at the 1% level, but with a level of bias of only 14%. Households in Chifra are also 10% more likely to believe that land rules are fair, though the level of bias falls also below the 25% threshold.

**TABLE 7.10 GOVERNANCE INDICATORS—CHIFRA**

	Treatment	Cluster S.E.	Constant	Cluster S.E.	N	% Bias
Any Ganta Meetings About Grazing Land	-0.01	0.03	0.17***	0.02	1492	4%
Land Rules Fair (Scale)	-0.13***	0.04	2.01***	0.03	1038	22%
Water Rules Fair (Scale)	-0.1*	0.06	2.07	0.04	1144	14%
Satisfied With Customary Leader's Land Management	-0.01	0.03	0.17***	0.02	1492	4%
Satisfied With Customary Leader's Water Management	-0.13***	0.04	2.01***	0.03	1038	22%
Land Decision Making is Clear	-0.1*	0.06	2.07	0.04	1144	14%
Water Decision Making is Clear	-0.01	0.03	0.17***	0.02	1492	4%
Land ladder of power—Subclan Leader	-0.13***	0.04	2.01***	0.03	1038	22%
Land ladder of power—Fiema Abba	-0.1*	0.06	2.07	0.04	1144	14%
Land ladder of power—Duwa Abba	-0.01	0.03	0.17***	0.02	1492	4%
Land ladder of power—Clan Leader	-0.13***	0.04	2.01***	0.03	1038	22%
Land ladder of power—Daar Idolla	-0.1*	0.06	2.07	0.04	1144	14%
Land ladder of power—Youth	-0.01	0.03	0.17***	0.02	1492	4%
Land ladder of power—Women	-0.13***	0.04	2.01***	0.03	1038	22%
Land ladder of power—Women	-0.1*	0.06	2.07	0.04	1144	14%
Investors Operating in Kebele	-0.01	0.03	0.17***	0.02	1492	4%

## GRAZING

Of the six grazing indicators, four are statistically significant and have a level of bias above 25%. Households in Chifra are more likely to report the area of their dry and wet season grazing areas are decreasing, significant at the 1% level, and to believe that the average condition of both their wet and dry season grazing areas are decreasing, significant at the 1% level. These differences in perceived grazing area conditions will be taken into consideration during analysis. The average distance to wet and dry season grazing areas is similar between Chifra and control households.

**TABLE 7.11 GRAZING AREA INDICATORS—CHIFRA**

	Treatment	Cluster S.E.	Constant	Cluster S.E.	N	% Bias
Average Distance to WS (Hours)	-2.01*	1.19	14.61	0.89	817	15%
Average Condition of WS (Scale)	0.27***	0.06	2.49	0.05	811	46%
WS Area Change (Scale)	0.16***	0.06	2.58	0.05	804	32%
Average Distance to DS (Hours)	5.66	4.47	24.04***	2.77	665	12%
Average Condition of DS (Scale)	0.22***	0.07	2.48	0.06	665	39%
DS Area Change (Scale)	0.18***	0.06	2.55	0.06	657	35%

## TENURE SECURITY

There are also potential balance concerns in the tenure security indicators. Of the 24 indicators examined, six are both statistically significantly different and have a level of bias above 25%. In general, households in Chifra report higher levels of security across a variety of variables than households in the control woredas. In both wet and dry season grazing areas, Chifra households are more likely to report their boundaries are clear, right to access water points respected, and safe from government, significant at the 1% level. Treatment households are less likely to believe their community land will be encroached upon by local or national government, significant at the 1% level and with a level of bias above 25%.

**TABLE 7.12 TENURE SECURITY INDICATORS—CHIFRA**

	<b>Treatment</b>	<b>Cluster S.E.</b>	<b>Constant</b>	<b>Cluster S.E.</b>	<b>N</b>	<b>% Bias</b>
WS Graze Restrictions	-0.02	0.01	0.02*	0.01	813	14%
WS Elite Encroachment (Scale)	-0.04*	0.02	2.96***	0.02	793	14%
WS Investor Encroachment (Scale)	-0.04*	0.03	2.96***	0.02	795	13%
WS Ganta Leader Encroachment (Scale)	0.01	0.03	2.93***	0.02	792	2%
WS Clan Leader Encroachment (Scale)	-0.04	0.02	2.96***	0.02	792	11%
WS Afar Clan Encroachment (Scale)	-0.01	0.02	2.97***	0.01	797	6%
WS Outside Clan Encroachment (Scale)	0	0.02	2.96***	0.02	796	0%
WS Right to Access Water Points Respected (Scale)	-0.35***	0.07	1.63	0.06	788	47%
WS Grazing Boundaries Clear (Scale)	-0.26***	0.07	1.49	0.06	797	37%
WS Safe From Government (Scale)	-0.28***	0.08	1.76	0.06	781	33%
WS Safe From Investors (Scale)	-0.21**	0.08	1.76	0.06	778	24%
DS Graze Restrictions	-0.02*	0.01	0.03***	0.01	667	16%
DS Elite Encroachment (Scale)	0.14**	0.06	3.06	0.04	621	24%
DS Investor Encroachment (Scale)	0.04	0.04	2.88***	0.03	626	10%
DS Ganta Leader Encroachment (Scale)	0.09**	0.04	2.84***	0.03	631	22%
DS Clan Leader Encroachment (Scale)	0.04	0.03	2.9***	0.03	631	13%
DS Afar Clan Encroachment (Scale)	0.03	0.03	2.93***	0.02	628	11%
DS Outside Clan Encroachment (Scale)	0.05	0.03	2.89***	0.03	632	13%
DS Right to Access Water Points Respected (Scale)	-0.13**	0.06	1.37	0.05	638	19%
DS Grazing Boundaries Clear (Scale)	-0.1	0.06	1.33***	0.04	646	15%
DS Safe From Government (Scale)	-0.28***	0.08	1.67	0.06	627	34%
DS Safe From Investors (Scale)	-0.18**	0.09	1.67	0.07	627	21%
Likelihood of Local Government Encroachment on Ganta (Scale)	-0.19***	0.04	4.94***	0.02	1374	29%
Likelihood of National Government Encroachment on Ganta (Scale)	-0.32***	0.05	4.94***	0.02	1373	45%

## POWER ANALYSIS

In this section we update the power calculations at the community and the household level using the baseline sample. At the IE design stage, we necessarily conducted the power analyses using target numbers of communities and approximated intra-class correlation (ICC) values in the absence of actual data. Refer to Annex I—LAND Afar IE Design Report for more detail on the initial calculations. Using the updated number of communities and ICC values, we have a stronger sense of how well this IE will be able to detect treatment changes.

At the community level, due to the small number of communities in the woredas, we fell 37 gantas short of our 300 ganta target, reducing the Minimum Detectable Effect Size (MDES) at the ganta level to .38-.41 from an anticipated .34-.36.

At the household level, we calculate ICC from the baseline sample for key outcome variables to obtain updated MDES estimates. Tables 7.9 & 7.10 present an updated expected MDES for several variables. The household-level variables used here reflect many of the expected outcome indicators for the LAND Afar IE. As previously introduced, the household sample represents data from 3,157 households across 263 communities, and an average of about ten respondents in each community. Because of the interaction between ICC, MDES, and slightly different response rates for variables, the power of this study varies across indicators.

The IE Design report estimated that with 150 communities in each arm of the study, ten observations from each community, and an ICC of 0.10, study variables would have an MDES of 0.15. Using the baseline data, it is now possible to see that the actual ICC for all village clusters ranges from 0.01 to 0.67, with an average of 0.18, and the MDES values range from 0.11 to 0.27, with an average of 0.17. The values are well within the predicted range. In Amibara, the ICC ranges from 0.00 to 0.61, with an average of 0.18. MDES values range from 0.15 to 0.43, with an average of 0.26. In Chifra, the actual ICC for village clusters ranges from .02 to .26, with an average of .12. MDES values range from .16 to .30 with an average of .26.

We will focus on variables which are likely indicators of our outcomes of interest at the household level. These are, in short, (1) improved wet and dry season grazing conditions, (2) greater tenure security and protection of wet and dry season grazing areas, (3) improved customary governance institutions, and (4) greater tenure security and protection of ganta land. See the IE design report for further detail.

The updated power analyses indicate the study may be somewhat less powered than we had originally anticipated to detect fine-scale changes in likelihood of encroachment from investors and government, as well as access rights to land and water and satisfaction with customary leaders, particularly in Amibara, although the MDES values for these indicators are still well within the typical range of detectable effects for such studies. In particular, indicators with a higher detectable percent change typically represent activities which are less common, like the sale of livestock and crops. Taking into account the higher MDES values for these indicators, the pre-analysis plan will further explore additional relevant indicators for these outcomes and any potential gains in detectable effect sizes that may be possible. The updated power analysis shows that for the entire sample, the evaluation will be able to detect changes in the 2% to the 75% range, with an average of 15%. In Amibara, the evaluation is likely to be able to detect changes in the 3% to 100% range, with an average of 22%. In Chifra, the evaluation is likely to be able to detect changes in the 2% to 100% range, with an average of 14%. The evaluation is less well-powered to detect small community level changes, but will be able to capture large-to-

moderate changes at the ganta level. The extensive qualitative data collection will help the analysis document smaller changes in outcomes at endline.

By this measure, this IE meets design expectations. Overall, the study is sufficiently powered to detect moderate-sized, policy-relevant magnitudes of change at the household level. The study's pre-analysis plan will provide additional detail on any power issues and expected detectable change by indicator.

**TABLE 7.13 POWER CALCULATIONS OF SELECT HOUSEHOLD INDICATORS, WHOLE SAMPLE**

Variable	Cluster Number	Average Cluster Size	Mean (SD)	ICC	MDES	Point Change	Percent Change
<b>Grazing Indicators</b>							
Average Condition of WS (Scale)	299	5.24	2.65 (0.61)	0.2	0.19	0.12	5%
WS Area Change (Scale)	299	5.21	2.71 (0.53)	0.15	0.18	0.1	4%
Average Condition of DS (Scale)	260	3.76	2.63 (0.57)	0.24	0.23	0.13	5%
DS Area Change (Scale)	261	3.72	2.69 (0.5)	0.21	0.23	0.11	4%
<b>Tenure Security Indicators</b>							
WS Elite Encroachment (Scale)	299	5.14	2.88 (0.44)	0.06	0.16	0.07	2%
WS Investor Encroachment (Scale)	298	5.15	2.88 (0.46)	0.09	0.17	0.08	3%
WS Ganta Leader Encroachment (Scale)	299	5.16	2.9 (0.42)	0.09	0.17	0.07	2%
WS Clan Leader Encroachment (Scale)	299	5.15	2.9 (0.42)	0.07	0.16	0.07	2%
WS Afar Clan Encroachment (Scale)	297	5.2	2.92 (0.38)	0.1	0.17	0.06	2%
WS Outside Clan Encroachment (Scale)	299	5.16	2.92 (0.37)	0.07	0.16	0.06	2%
WS Right to Access Water Points Respected (Scale)	297	5.14	1.37 (0.74)	0.16	0.19	0.14	10%
WS Grazing Boundaries Clear (Scale)	299	5.18	1.3 (0.68)	0.17	0.19	0.13	10%
WS Safe From Government (Scale)	299	5.12	1.48 (0.81)	0.15	0.18	0.15	10%
WS Safe From Investors (Scale)	299	5.12	1.53 (0.84)	0.18	0.19	0.16	10%
DS Elite Encroachment (Scale)	261	3.56	3.04 (0.63)	0.3	0.25	0.15	5%
DS Investor Encroachment (Scale)	260	3.6	2.87 (0.47)	0.25	0.24	0.11	4%
DS Ganta Leader Encroachment (Scale)	261	3.61	2.88 (0.45)	0.31	0.25	0.11	4%
DS Clan Leader Encroachment (Scale)	261	3.61	2.9 (0.42)	0.26	0.24	0.1	3%
DS Afar Clan Encroachment (Scale)	259	3.62	2.91 (0.39)	0.42	0.27	0.1	3%
DS Outside Clan Encroachment (Scale)	261	3.61	2.89 (0.44)	0.31	0.25	0.11	4%
DS Right to Access Water Points Respected (Scale)	261	3.64	1.33 (0.71)	0.19	0.22	0.16	12%
DS Grazing Boundaries Clear (Scale)	261	3.68	1.31 (0.69)	0.2	0.22	0.16	12%
DS Safe From Government (Scale)	258	3.63	1.5 (0.83)	0.22	0.23	0.19	13%



**TABLE 7.13 POWER CALCULATIONS OF SELECT HOUSEHOLD INDICATORS, WHOLE SAMPLE**

Variable	Cluster Number	Average Cluster Size	Mean (SD)	ICC	MDES	Point Change	Percent Change
DS Safe From Investors (Scale)	260	3.61	1.56 (0.87)	0.24	0.23	0.2	13%
Likelihood of Local Government Encroachment on Ganta (Scale)	302	9.23	4.68 (0.89)	0.07	0.13	0.12	3%
Likelihood of National Government Encroachment on Ganta (Scale)	302	9.24	4.62 (0.95)	0.09	0.14	0.13	3%
<b>Land Governance Indicators</b>							
Any Ganta Meetings About Grazing Land	302	9.89	0.18 (0.39)	0.11	0.14	0.06	33%
Land Rules Fair (Scale)	302	7.59	2 (0.62)	0.1	0.15	0.09	4%
Water Rules Fair (Scale)	302	8.32	2.03 (0.71)	0.12	0.15	0.11	5%
Satisfied With Customary Leader's Land Management	302	8.11	2.09 (0.99)	0.11	0.15	0.15	7%
Satisfied With Customary Leader's Water Management	302	8.23	2.05 (0.99)	0.1	0.15	0.15	7%
Land Decision Making is Clear	302	8.97	2.33 (0.97)	0.15	0.16	0.16	7%
Water Decision Making is Clear	302	9.13	2.36 (0.95)	0.16	0.16	0.15	6%
Land ladder of power—Ganta Leader	302	9.18	6.02 (2.44)	0.22	0.18	0.44	7%
Land ladder of power—Subclan Leader	302	9.18	6.76 (3.02)	0.15	0.16	0.48	7%
Land ladder of power—Fiema Abba	302	9.25	6.96 (2.44)	0.08	0.14	0.33	5%
Land ladder of power—Duwa Abba	302	8.99	6.96 (9.97)	0.01	0.11	1.12	16%
Land ladder of power—Clan Leader	302	9.25	8.16 (2.32)	0.17	0.16	0.38	5%
Land ladder of power—Daar Idolla	302	9.05	6.84 (2.51)	0.11	0.15	0.37	5%
Land ladder of power—Youth	302	8.63	4.35 (2.32)	0.24	0.19	0.43	10%
Land ladder of power—Women	300	8.48	2.75 (2.03)	0.21	0.18	0.36	13%
Investors Operating in Kebele	302	9.8	0.16 (0.37)	0.67	0.27	0.1	62%
<b>Livelihood Indicators</b>							
Sold Livestock	302	9.88	0.65 (0.48)	0.16	0.16	0.08	12%
Sold Crops	302	9.88	0.04 (0.2)	0.12	0.15	0.03	75%
Income from Trade or Labor	302	9.87	0.19 (0.39)	0.22	0.18	0.07	37%
Experienced Hunger	302	9.89	0.64 (0.48)	0.2	0.17	0.08	12%
Durable Asset Index	302	9.89	-4.07 (2.87)	0.27	0.19	0.54	13%
Agricultural Asset Index	302	9.89	-1.44 (1.4)	0.18	0.17	0.23	16%
Weekly No. of Meals With Meat	302	9.88	0.21 (0.68)	0.15	0.16	0.11	52%
Log HH Expenditures	302	9.89	6.81 (1.41)	0.07	0.13	0.18	3%
Log HH Health Expenditures	302	9.89	2.69 (3.21)	0.09	0.14	0.44	16%

**TABLE 7.14 POWER CALCULATIONS OF SELECT HOUSEHOLD INDICATORS, AMIBARA**

Variable	Cluster Number	Average Cluster Size	Mean (SD)	ICC	MDES	Point Change	Percent Change
<b>Grazing Indicators</b>							
Average Condition of WS (Scale)	149	5.07	2.63 (0.64)	0.2	0.28	0.18	7%
WS Area Change (Scale)	149	5.06	2.73 (0.56)	0.08	0.24	0.13	5%
Average Condition of DS (Scale)	113	2.77	2.65 (0.58)	0.21	0.37	0.22	8%
DS Area Change (Scale)	114	2.75	2.75 (0.5)	0.07	0.34	0.17	6%
<b>Tenure Security Indicators</b>							
WS Elite Encroachment (Scale)	149	4.99	2.83 (0.54)	0.04	0.22	0.12	4%
WS Investor Encroachment (Scale)	147	5.04	2.83 (0.54)	0.1	0.25	0.13	5%
WS Ganta Leader Encroachment (Scale)	149	5.04	2.86 (0.5)	0.08	0.24	0.12	4%
WS Clan Leader Encroachment (Scale)	149	5.01	2.86 (0.49)	0.07	0.23	0.11	4%
WS Afar Clan Encroachment (Scale)	148	5.05	2.87 (0.48)	0.06	0.23	0.11	4%
WS Outside Clan Encroachment (Scale)	149	5.01	2.89 (0.45)	0.05	0.23	0.1	3%
WS Right to Access Water Points Respected (Scale)	149	4.97	1.35 (0.74)	0.16	0.27	0.2	15%
WS Grazing Boundaries Clear (Scale)	149	5.05	1.29 (0.69)	0.18	0.27	0.19	15%
WS Safe From Government (Scale)	149	5.04	1.38 (0.76)	0.15	0.26	0.2	14%
WS Safe From Investors (Scale)	149	5.05	1.43 (0.8)	0.17	0.27	0.21	15%
DS Elite Encroachment (Scale)	114	2.71	2.83 (0.65)	0.39	0.42	0.27	10%
DS Investor Encroachment (Scale)	114	2.73	2.81 (0.58)	0.38	0.41	0.24	9%
DS Ganta Leader Encroachment (Scale)	114	2.72	2.83 (0.54)	0.45	0.43	0.23	8%
DS Clan Leader Encroachment (Scale)	114	2.73	2.83 (0.54)	0.39	0.41	0.22	8%
DS Afar Clan Encroachment (Scale)	113	2.74	2.83 (0.56)	0.44	0.43	0.24	8%
DS Outside Clan Encroachment (Scale)	114	2.72	2.81 (0.58)	0.44	0.43	0.25	9%
DS Right to Access Water Points Respected (Scale)	114	2.74	1.39 (0.78)	0.4	0.42	0.32	23%
DS Grazing Boundaries Clear (Scale)	114	2.75	1.37 (0.76)	0.42	0.42	0.32	23%
DS Safe From Government (Scale)	113	2.74	1.51 (0.86)	0.35	0.41	0.35	23%
DS Safe From Investors (Scale)	114	2.73	1.56 (0.88)	0.31	0.4	0.35	22%
Likelihood of Local Government Encroachment on Ganta (Scale)	152	9.3	4.54 (1.04)	0.03	0.17	0.17	4%
Likelihood of National Government Encroachment on Ganta (Scale)	152	9.33	4.5 (1.07)	0.04	0.17	0.19	4%
<b>Land Governance Indicators</b>							

**TABLE 7.14 POWER CALCULATIONS OF SELECT HOUSEHOLD INDICATORS, AMIBARA**

Variable	Cluster Number	Average Cluster Size	Mean (SD)	ICC	MDES	Point Change	Percent Change
Any Ganta Meetings About Grazing Land	152	9.84	0.2 (0.4)	0.1	0.2	0.08	40%
Land Rules Fair (Scale)	152	8.24	2.05 (0.65)	0.09	0.2	0.13	6%
Water Rules Fair (Scale)	152	9	2.06 (0.7)	0.1	0.2	0.14	7%
Satisfied With Customary Leader's Land Management	152	8.83	2.11 (1.07)	0.13	0.22	0.23	11%
Satisfied With Customary Leader's Water Management	152	9.01	2.05 (1.04)	0.12	0.21	0.22	11%
Land Decision Making is Clear	152	9.19	2.19 (0.87)	0.11	0.21	0.18	8%
Water Decision Making is Clear	152	9.41	2.21 (0.85)	0.13	0.22	0.18	8%
Land ladder of power—Subclan Leader	152	8.81	5.55 (2.46)	0.2	0.25	0.61	11%
Land ladder of power—Fiema Abba	152	9.44	6.48 (3.42)	0.12	0.21	0.72	11%
Land ladder of power—Duwa Abba	152	9.41	7.09 (2.34)	0.06	0.18	0.43	6%
Land ladder of power—Clan Leader	152	8.99	6.99 (13.81)	0	0.15	2.11	30%
Land ladder of power—Daar Idolla	152	9.51	8.02 (2.37)	0.2	0.24	0.58	7%
Land ladder of power—Youth	152	9.15	6.79 (2.49)	0.09	0.2	0.5	7%
Land ladder of power—Women	152	7.95	3.75 (2.03)	0.4	0.32	0.64	17%
Land ladder of power—Women	150	7.69	2.12 (1.81)	0.18	0.25	0.45	21%
Investors Operating in Kebele	152	9.76	0.32 (0.47)	0.61	0.37	0.17	53%
<b>Livelihood Indicators</b>							
Sold Livestock	152	9.82	0.59 (0.49)	0.14	0.22	0.11	19%
Sold Crops	152	9.83	0.05 (0.23)	0.16	0.23	0.05	100%
Income from Trade or Labor	152	9.83	0.25 (0.43)	0.24	0.26	0.11	44%
Experienced Hunger	152	9.84	0.79 (0.4)	0.14	0.22	0.09	11%
Durable Asset Index	152	9.84	-5.05 (2.83)	0.18	0.23	0.66	13%
Agricultural Asset Index	152	9.84	-1.65 (1.55)	0.2	0.24	0.38	23%
Weekly No. of Meals With Meat	152	9.82	0.19 (0.65)	0.12	0.21	0.14	74%
Log HH Expenditures	152	9.84	6.77 (1.4)	0.07	0.19	0.26	4%
Log HH Health Expenditures	152	9.84	2.81 (3.29)	0.14	0.22	0.72	26%
No. Wet Season Grazing Areas	152	9.84	0.54 (0.58)	0.1	0.2	0.12	22%
No. Dry Season Grazing Areas	152	9.84	0.22 (0.44)	0.15	0.22	0.1	45%
Female Livestock	152	9.84	27.23 (26.3)	0.11	0.2	5.39	20%
Male Livestock	152	9.84	3.87 (6.66)	0.08	0.19	1.27	33%
Sale of Livestock Products	152	9.84	0.05 (0.22)	0.15	0.22	0.05	100%
HH Farm Area (Hectares)	152	9.84	0.71 (2.89)	0.04	0.17	0.49	69%
Veterinary Expenses	152	9.84	0.63 (1.83)	0.17	0.23	0.42	67%
Any Investment in Grazing Areas	152	9.84	0.05 (0.22)	0.07	0.19	0.04	80%

**TABLE 7.15 POWER CALCULATIONS OF SELECT HOUSEHOLD INDICATORS, CHIFRA**

Variable	Cluster Number	Average Cluster Size	Mean (SD)	ICC	MDES	Point Change	Percent Change
<b>Grazing Indicators</b>							
Average Condition of WS (Scale)	151	5.37	2.67 (0.57)	0.19	0.27	0.15	6%
WS Area Change (Scale)	151	5.32	2.69 (0.5)	0.23	0.28	0.14	5%
Average Condition of DS (Scale)	147	4.52	2.62 (0.56)	0.26	0.3	0.17	6%
DS Area Change (Scale)	147	4.47	2.66 (0.5)	0.26	0.3	0.15	6%
<b>Tenure Security Indicators</b>							
WS Elite Encroachment (Scale)	151	5.66	2.94 (0.31)	0.05	0.21	0.07	2%
WS Investor Encroachment (Scale)	151	5.67	2.93 (0.34)	0.05	0.21	0.07	2%
WS Ganta Leader Encroachment (Scale)	151	5.65	2.94 (0.33)	0.13	0.24	0.08	3%
WS Clan Leader Encroachment (Scale)	151	5.65	2.94 (0.31)	0.05	0.21	0.07	2%
WS Afar Clan Encroachment (Scale)	150	5.72	2.97 (0.23)	0.19	0.27	0.06	2%
WS Outside Clan Encroachment (Scale)	151	5.68	2.96 (0.26)	0.09	0.23	0.06	2%
WS Right to Access Water Points Respected (Scale)	149	5.68	1.39 (0.73)	0.12	0.24	0.18	13%
WS Grazing Boundaries Clear (Scale)	151	5.67	1.31 (0.66)	0.13	0.24	0.16	12%
WS Safe From Government (Scale)	151	5.54	1.56 (0.82)	0.13	0.25	0.2	13%
WS Safe From Investors (Scale)	151	5.52	1.62 (0.86)	0.17	0.26	0.22	14%
DS Elite Encroachment (Scale)	147	4.6	3.14 (0.6)	0.19	0.28	0.17	5%
DS Investor Encroachment (Scale)	146	4.68	2.9 (0.4)	0.12	0.26	0.1	3%
DS Ganta Leader Encroachment (Scale)	147	4.68	2.9 (0.4)	0.12	0.26	0.1	3%
DS Clan Leader Encroachment (Scale)	147	4.68	2.93 (0.34)	0.09	0.25	0.08	3%
DS Afar Clan Encroachment (Scale)	146	4.68	2.95 (0.28)	0.12	0.26	0.07	2%
DS Outside Clan Encroachment (Scale)	147	4.69	2.92 (0.36)	0.1	0.25	0.09	3%
DS Right to Access Water Points Respected (Scale)	147	4.72	1.27 (0.65)	0.04	0.23	0.15	12%
DS Grazing Boundaries Clear (Scale)	147	4.77	1.25 (0.62)	0.06	0.24	0.15	12%
DS Safe From Government (Scale)	145	4.7	1.5 (0.82)	0.19	0.28	0.23	15%
DS Safe From Investors (Scale)	146	4.67	1.56 (0.87)	0.24	0.3	0.26	17%
Likelihood of Local Government Encroachment on Ganta (Scale)	151	9.81	4.84 (0.64)	0.09	0.2	0.13	3%
Likelihood of National Government Encroachment on Ganta (Scale)	151	9.8	4.76 (0.76)	0.14	0.22	0.17	4%
<b>Land Governance Indicators</b>							
Any Ganta Meetings About Grazing Land	151	9.88	0.17 (0.37)	0.12	0.21	0.08	47%

**TABLE 7.15 POWER CALCULATIONS OF SELECT HOUSEHOLD INDICATORS, CHIFRA**

Variable	Cluster Number	Average Cluster Size	Mean (SD)	ICC	MDES	Point Change	Percent Change
Land Rules Fair (Scale)	151	6.87	1.93 (0.59)	0.1	0.22	0.13	7%
Water Rules Fair (Scale)	151	7.58	2 (0.73)	0.15	0.24	0.17	8%
Satisfied With Customary Leader's Land Management	151	7.34	2.06 (0.88)	0.09	0.21	0.19	9%
Satisfied With Customary Leader's Water Management	151	7.4	2.05 (0.93)	0.08	0.21	0.19	9%
Land Decision Making is Clear	151	8.7	2.48 (1.04)	0.14	0.22	0.23	9%
Water Decision Making is Clear	151	8.77	2.51 (1.03)	0.15	0.23	0.23	9%
<b>Livelihood Indicators</b>							
Sold Livestock	151	9.87	0.7 (0.46)	0.16	0.23	0.1	14%
Sold Crops	151	9.86	0.03 (0.16)	0.03	0.16	0.03	100%
Income from Trade or Labor	151	9.85	0.12 (0.33)	0.14	0.22	0.07	58%
Experienced Hunger	151	9.88	0.49 (0.5)	0.09	0.2	0.1	20%
Durable Asset Index	151	9.88	-3.08 (2.57)	0.16	0.23	0.58	19%
Agricultural Asset Index	151	9.88	-1.22 (1.18)	0.11	0.21	0.24	20%
Weekly No. of Meals With Meat	151	9.88	0.23 (0.7)	0.18	0.24	0.16	70%
Log HH Expenditures	151	9.88	6.84 (1.42)	0.08	0.19	0.27	4%
Log HH Health Expenditures	151	9.88	2.56 (3.12)	0.04	0.17	0.53	21%
Log HH Education Expenditures	151	9.88	2.01 (2.96)	0.13	0.21	0.63	31%
No. Wet Season Grazing Areas	151	9.88	0.74 (0.83)	0.24	0.26	0.21	28%
No. Dry Season Grazing Areas	151	9.88	0.53 (0.68)	0.17	0.23	0.16	30%
Female Livestock	151	9.88	18.88 (20.6)	0.14	0.22	4.51	24%
Male Livestock	151	9.88	3.9 (5.86)	0.15	0.22	1.31	34%
Sale of Livestock Products	151	9.85	0.06 (0.23)	0.07	0.19	0.04	67%
HH Farm Area (Hectares)	151	9.88	0.38 (1.82)	0.02	0.16	0.29	76%
Veterinary Expenses	151	9.88	1.02 (2.13)	0.19	0.24	0.51	50%
Any Investment in Grazing Areas	151	9.88	0.04 (0.2)	0.05	0.18	0.04	100%

# ANNEX I—LAND AFAR IE DESIGN REPORT

The LAND Afar IE Design Report can be found at the following URL:

<https://www.land-links.org/evaluation/land-administration-nurture-development-project-land-ethiopia/>

# REFERENCES

- “Afar National Regional State: Programme of Plan on Adaptation to Climate Change.” Semera: Environmental Protection Authority of the Federal Democratic Republic of Ethiopia, October 2010.
- Adem, Ato Alebachew, Ato Belayhun Hailu, Dr. Daniel Temesgen, Ato Elizabeth Milton, and Milha Desta. (2010). "Afar National Regional State Programme of Plan on Adaptation to Climate Change." Print.
- Admasu, D. (2008, December). Invasive Plants and Food Security: the case of *Prosopis juliflora* in the Afar region of Ethiopia.
- Austin, Peter C. 2009. “Using the standardized difference to compare the prevalence of a binary variable between two groups in observational research.” *Communications in Statistics – Simulation and Computation* 38(6): 1228-1234. doi: 10.1080/03610910902859574.
- Balehegn, Mulubrhan, and Kelemework Tafere. “Gendered Impacts and Adaptation Mechanisms to Climate Change Among Afar Pastoralists in North Eastern Ethiopia.” In *Impacts of Climate Change and Variability on Pastoralist Women in Sub-Saharan Africa*, edited by Munaye Mulinge and Getu Melese, 83. Kampala: Fountain Publishers, 2013.
- Behnke, Roy, Carol Kerven, Ian Scoones, Andy Catley, and Jeremy Lind. “Counting the Costs: Replacing Pastoralism with Irrigated Agriculture in the Awash Valley.” In *Pastoralism and Development in Africa: Dynamic Change at the Margins*, 57. New York: Routledge, 2013.
- Beyene, Shimelis. “Livelihood Diversification among the Pastoral and Agropastoral Groups in the Upper Awash Valley, Ethiopia.” *Journal of Human Ecology* 39, no. 3 (2012): 241–53.
- Cossins, Noel J. *No Way to Live: A Study of the Afar Clans of the North-East Rangelands*. North-East Rangelands Development Project, 1972.
- Cotula, Lorenzo, Sonja Vermeulen, Rebeca Leonard, and James Keeley. “Land Grab or Development Opportunity.” *Agricultural Investment and International Land Deals in Africa*, 2009, 130.
- Eriksen, Siri, and Andrei Marin. “Pastoral Pathways: Climate Change Adaptation Lessons from Ethiopia.” The Development fund, 2011.
- Fratkin, Elliot. “Ethiopia’s Pastoralist Policies: Development, Displacement and Resettlement.” *Nomadic Peoples* 18, no. 1 (2014): 94–114.
- Helland, J. 2015. Afar Resilience Study. WP 2015:6. Bergen Norway: Christian Michelson Institute.
- Hundie, Bekele. “Conflicts between Afar Pastoralists and Their Neighbors: Triggers and Motivations.” *International Journal of Conflict and Violence* 4, no. 1 (2010): 135–48.

- . “Property Rights among Afar Pastoralists of Northeastern Ethiopia: Forms, Changes and Conflicts.” In *Survival of the Commons: Mounting Challenges and New Realities, the Eleventh Conference of the International Association for the Study of Common Property*. Bali, Indonesia, 2006.
- Hundie, Bekele, and Martina Padmanabhan. “The Transformation of the Afar Commons in Ethiopia: State Coercion, Diversification, and Property Rights Change among Pastoralists,” CAPRI working paper, no. 87, 2008.
- Imai, Kosuke, et al., 2008. “Misunderstandings between experimentalists and observationalists about causal inference.” *Journal of the Royal Statistical Society: Series A (Statistics in Society)* 171(2): 481-502. doi: 10.1111/j.1467-985X.2007.00527.x
- Stuart, Elizabeth. 2010. “Matching methods for causal inference: A review and look forward”. *Statistical Science* 25(1): 1-21. doi: 10.1214/09-STS313.
- USAID (2016). *Impact Evaluation of Ethiopia Land Administration to Nurture Development: Report on Baseline Findings*. USAID.



U.S. Agency for International Development  
1300 Pennsylvania Avenue, NW  
Washington, DC 20523  
Tel: (202) 712-0000  
Fax: (202) 216-3524  
[www.usaid.gov](http://www.usaid.gov)